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How a German Iron and Steel Plant is Equipped

Description of the Rheinische Stahlwerke, Which Include Blast Furnaces, Bessemer Converters, Rolling Mills and a By-Product Coke Plant

By Anton Schwartz

The Rheinische Stahlwerke at Duisburg-Meiderich, whose furnaces and mills are among the most modern in Germany, have been established in their present location on the river Rhine, since 1870. In addition to the steel plant, however, it operates coal mines near Wattenscheid and Rheinberg and iron mines at Algringen, from which the so-called minette ore is obtained. The production of such ore during 1912 was 472,235 tons.

Most of the ore is received by water from Spain, Sweden and other parts of Germany, but the product of the Algringen mines arrives by rail. The stock piles all front on the north basin of the harbor at Duisburg-Ruhrort, where there is 560 feet of shore line dockage. Three unloading bridges, each of 298 feet span, are used for transferring the ore from vessels to stock piles and again to distributing cars. These have a capacity of 70 metric tons (2,204 pounds) hourly. Auxiliary jib cranes, with a capacity of 75 tons, also are used in connection with the unloading bridges and for loading mill products on barges. These travel along rails on a wharf 995 feet in length. In the ore yard 350,000 tons can be stocked.

The coke is produced in 491 by-product ovens, which are of the Otto-Coppee type. The daily output amounts to 1,800 tons. Waste gases are used by firing the steam boilers. There is also a by-products plant, which last year produced 6,241 tons of coal tar, 3,255 tons of ammonia and 1,026 tons of benzol. The capacity is to be increased by 100 new ovens.

Four of the five blast furnaces usually are in blast, with one down for repairs, and the daily production is between 1,400 and 1,500 tons. Last year's production totaled 595,193 tons of pig. The two furnaces of most recent construction are supplied with electric incline hoists, while the older ones have vertical hoists. For the blast there are five gas blowing engines each of 3,500 horsepower, with another about to be installed. There are also four steam blowing engines in reserve. The blast is heated by furnace gas in 22 stoves of the Cowper type. The remaining gas is used for heating 55 steam boilers and also for driving gas engines.

The slag from the blast furnaces is conveyed in solid, fluid or granulated form, in specially constructed trucks, to the slag heap. Part of it can be used as road material or for the preparation of mortar. Another part of it

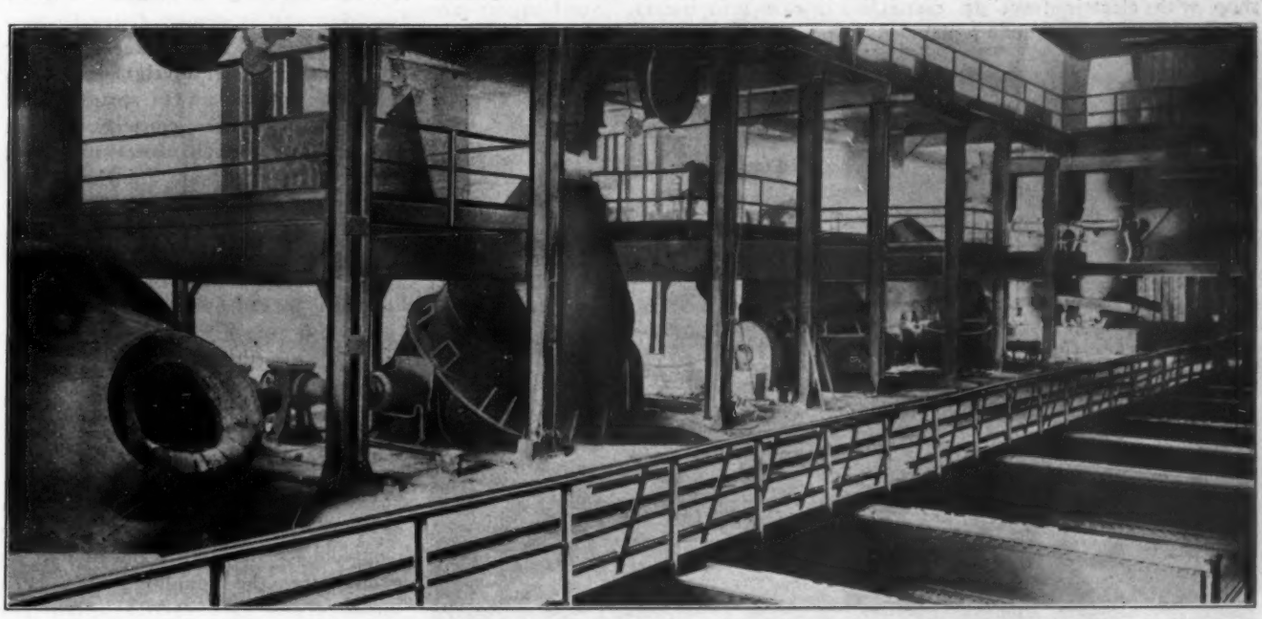


FIG. 1—THE BESSEMER STEEL DEPARTMENT, SHOWING THE FOUR CONVERTERS AND TWO CUPOLAS AT THE EXTREME RIGHT

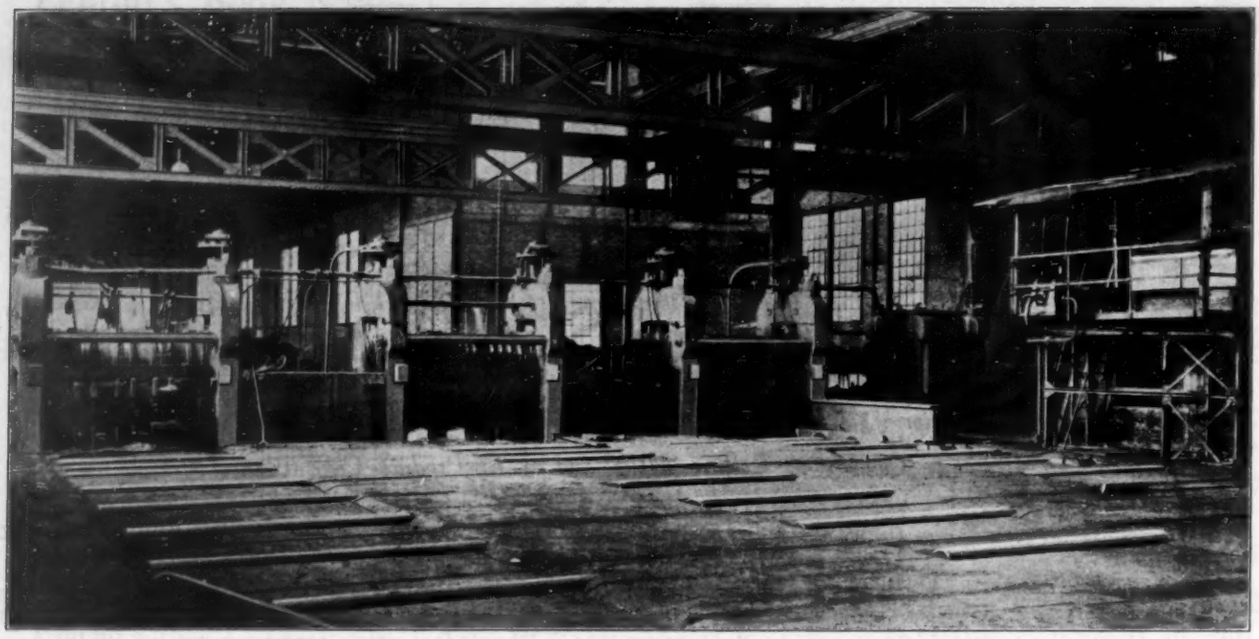


FIG. 2—THE BILLET MILL OF THE RHEINISCHE STAHLWERKE

is pressed into slag bricks. In the factory for that purpose four mixing mills and two brick presses of the Osnabruck type turn out daily 55,000 bricks. A plant for briquetting flue dust also has been installed.

The iron from the furnaces is tapped directly into ladle cars of 18 tons capacity each. From the furnaces the iron is delivered to the three mixers, one of cylindrical form and 750 tons capacity, and two converter-shaped mixers, each of 250 tons capacity. The mixers are not preheated and are hydraulically-operated. The water pressure necessary to actuate them is supplied by two electrically-driven pumps. A ladle repair shop with electric traveling crane is connected with the mixing plant.

Adjacent to the mixing plant is a cupola capable of melting 400 tons of iron daily. The molten iron flows directly from this furnace into the ladle cars which discharge their contents into the mixers without being hoisted. The steel works consist of two buildings, one containing the four Bessemer converters, Fig. 1. The converters have a capacity for producing 15 tons per heat. The blast for the converters is supplied by a vertical steam blowing engine of 5,000-horsepower capacity. In the converter house are located also three cupolas for melting spiegeleisen and one furnace for heating ferro-manganese. In the second building the steel is cast into ingots. Steel ingots are produced up to 7,050 pounds in weight. Four electric-hydraulic jib cranes of 7½ tons capacity each convey the ingots to the soaking pits.

The blooming mill building contains the soaking pits, blooming mill, engine room and two sheds for the storage of rolls. In the pit building two hydraulic 4½-ton jib cranes serve 72 soaking pits. The cranes charge the hot ingots into the pits, draw them out again when heated and place them on the tilting table of the blooming mill. Any ingots which have become cold are brought back to the proper temperature in heated pits. The latter are served by an electric overhead traveling crane of 5 tons capacity.

The reversing blooming mill is two-high and is driven direct by two electric motors which receive their direct current from an Ilgner set. On the other side is a twin steam engine of 6,000-horsepower capacity, geared 1 to 3. The 20-inch ingots are rolled into blooms of about 5 inches minimum section, but the greater number are in sections up to 14 inches. The blooms are cut with a steam hydraulic shear and by means of pull-offs are conveyed to the finishing mills.

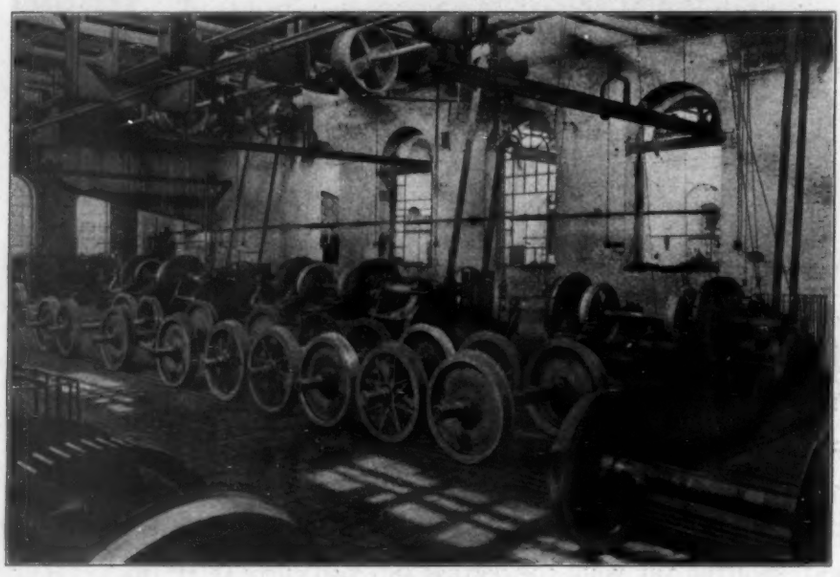


FIG. 3—THE CAR WHEEL FITTING AND TURNING PLANT

Rail Mill

The three-high rail mill is driven by a vertical tandem steam engine of 2,500-horsepower capacity. A noteworthy arrangement is used for changing the rolls. A 150-ton overhead electric traveling crane lifts the complete roll housing frame out of its place, after the couplings have been loosened and then carries it into the adjacent frame-fitting shop, brings out another complete pair of housings and

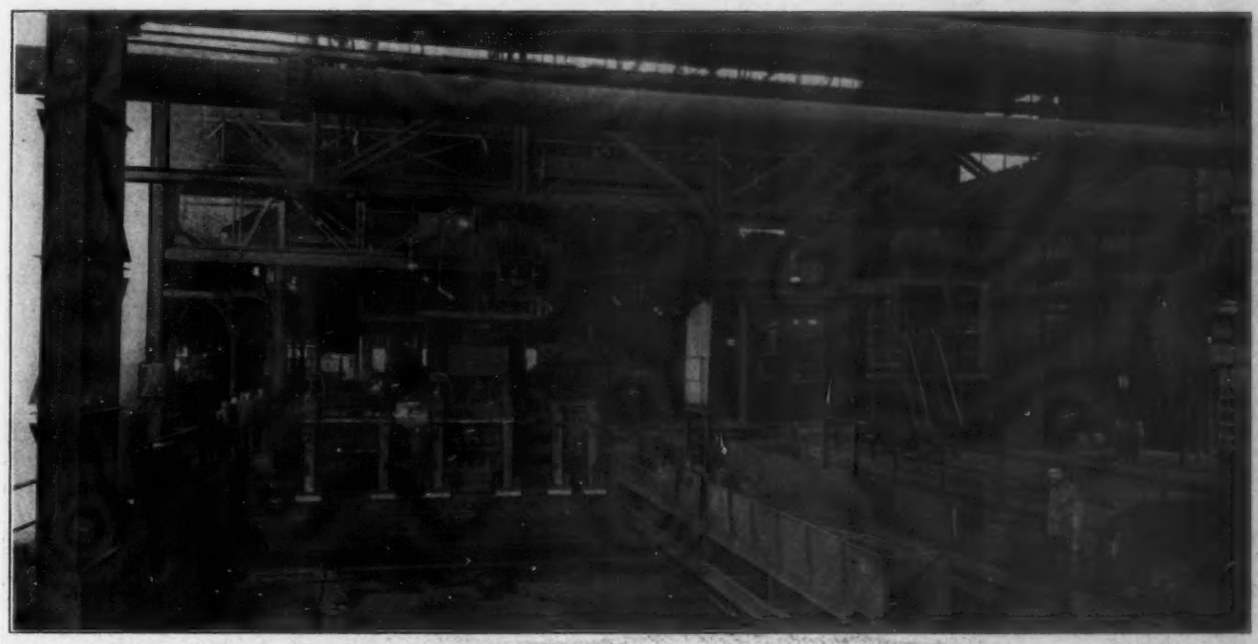


FIG. 4—THE BAR MILL

drops it into its place so that it is again in working order in the shortest possible time from the loosening of the couplings.

In addition to rails, tires and fish plates also are produced in the rail mill. Large shops are connected with the rolling mill for the fabricating of material.

Billet and Bar Mills

The billet mill practically duplicates the rail mill in general arrangement. Sheet bars also are rolled. After the material has been cut, it passes to the cooling tables where it is loaded for shipment.

The blooms from the blooming mill are placed by 5-ton electric cranes on separate tables at the rear of two horizontal heating furnaces and then are pushed into the furnaces by an electric charging machine.

The heating furnaces have a hearth 46 feet long and are 8 1/3 feet wide. Each is capable of heating 100 tons at a time. The heated blooms are drawn from the furnace by a winch and fall on a slide from which they are picked up by a conveyor and carried to the entering side of the billet mill.

The first and second three-high stands of billet mill rolls are driven directly by a gas engine. After the bloom has passed these two stands, it runs directly onto a roller table which serves the entering side of the finishing train which also consists of two stands of three-high rolls and alternately of three and two-high rolls. Behind the train there is also a tilting table which delivers the finished material to the saw. The finishing train is driven by a belt from the gas engine. The billet mill is commanded by a 35-ton crane.

Continuous Mill

The raw material for the continuous merchant mill is reheated in a continuous furnace. A table delivers the steel to eight two-high stands, the rolls of which are driven by a gas engine through spur gearing. After having passed this continuous mill, the material enters a Belgian train of four stands driven by a belt from the gas engine, and for smaller dimensions again through two stands driven by an electric motor. The finished material is carried to a hot bed. After cooling, several lengths are cut simultaneously, weighed and loaded by cranes.

There is another merchant mill of 5 stands, motor-driven, used for the production of steel required in electrical manufacturing, a roll turning shop, tire mill, pressed steel plant, forge shops, pattern shop, foundries, machine shops, locomotive roundhouse, repair plant, etc. A well-equipped laboratory also is maintained.

Calcining Plant.

The calcining plant is furnished with three cupolas in which the raw dolomite is burnt. The material then passes through a crusher, two grinding pans, a mixing machine in which

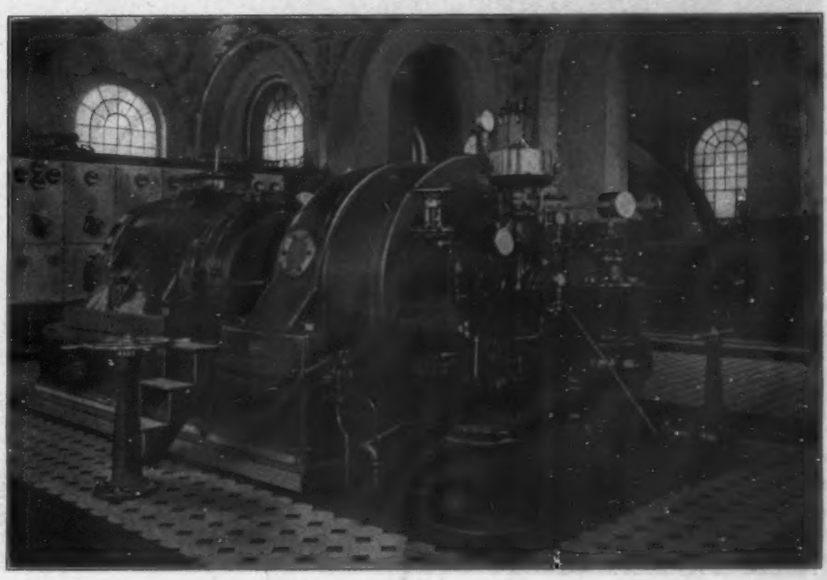


FIG. 5—A 1,000-KILOWATT TURBO-GENERATOR IN THE POWER STATION

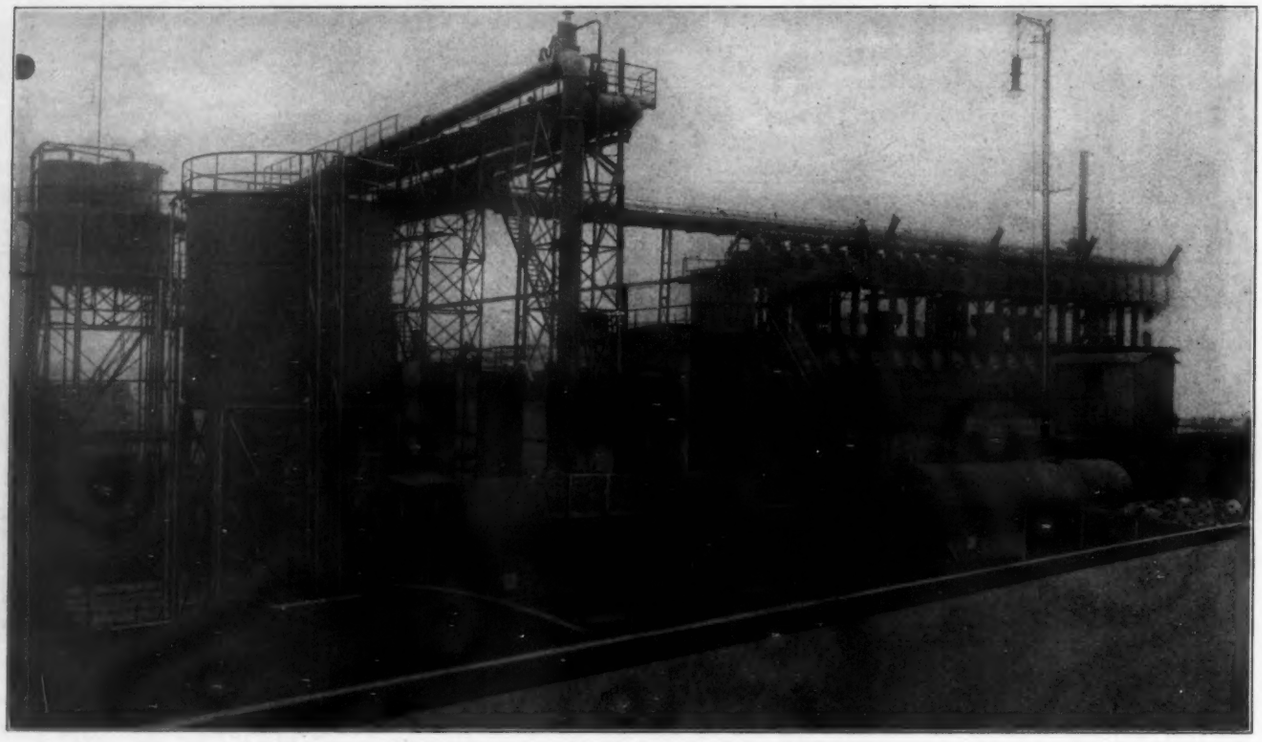


FIG. 6—THE BY-PRODUCT COKE PLANT

it is mixed with tar, and a finishing mill. The prepared tar is finished by the Centrum colliery at Wattenscheid. Two hydraulic presses, with the necessary pumps and accumulators, produce the fire brick necessary for the lining of the converters, and a bottom pressing machine furnishes the bottoms.

In addition to the works described, there are four small open-hearth furnaces; but this department is relatively unimportant. Last year's production was 689,461 tons of Bessemer and open-hearth steel, of which 545,545 tons were rolled into blooms, billets and merchant shapes.

Power is furnished from a station equipped with gas engines of 6,000-horsepower capacity and steam engines of 1,000-horsepower capacity, which drive generators producing direct current at 500 volts. The gas engines operate on blast furnace gas. A steam turbine also was added recently. The water supply is obtained from wells on the property and from a pumping station on the river Ruhr.

For the use of the workmen there are four change houses with shower

FIG. 7—THE STEEL TIRE MILL, SHOWING THE HEATING FURNACE

baths and three dining rooms, also a hospital and its various accessories. Two trained nurses and a number of volunteer nurses who are regularly instructed by the works' physician render first aid in all the workshops in cases of accident.

Besides the legally prescribed subscription to the Rhenish Westphalian Accident Society and the state invalid and old age insurance, the company also subscribes to a sick club, an invalid and widow and orphan club.

A boarding house conducted by the company provides healthy and cheap comfort for about 600 unmarried workmen. About 150 dwelling houses with gardens and stables which are situated in five groups in the precincts of Duisburg-Meiderich contain dwellings for nearly 400 foremen and workmen's families. The company, in fact, has made quite a feature of welfare work and is constantly striving to secure and maintain the good will of its employes, with benefits which are mutually felt.

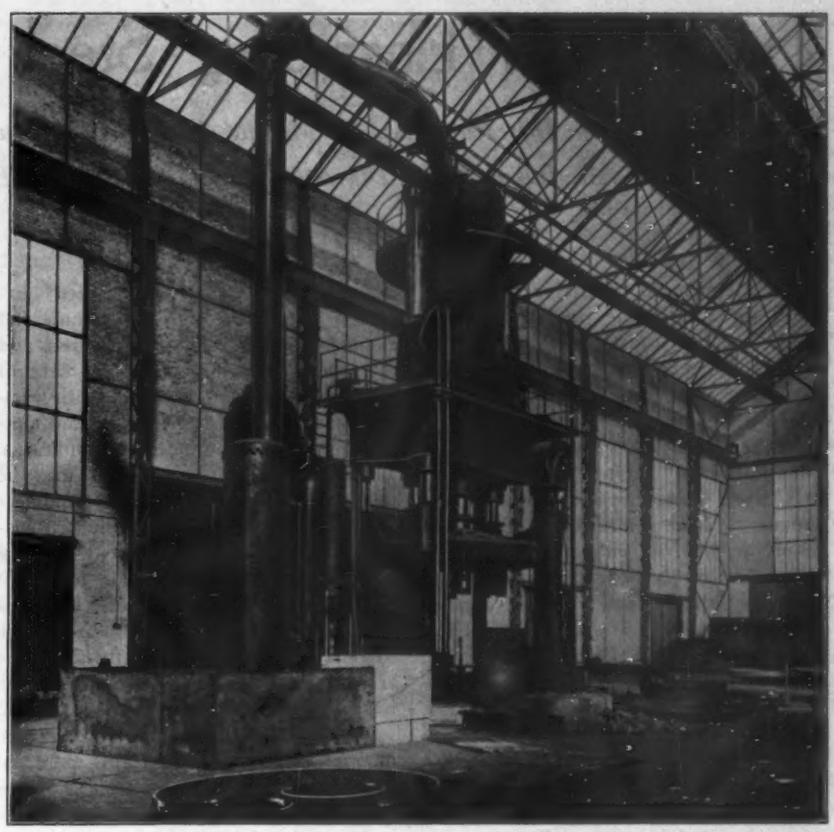
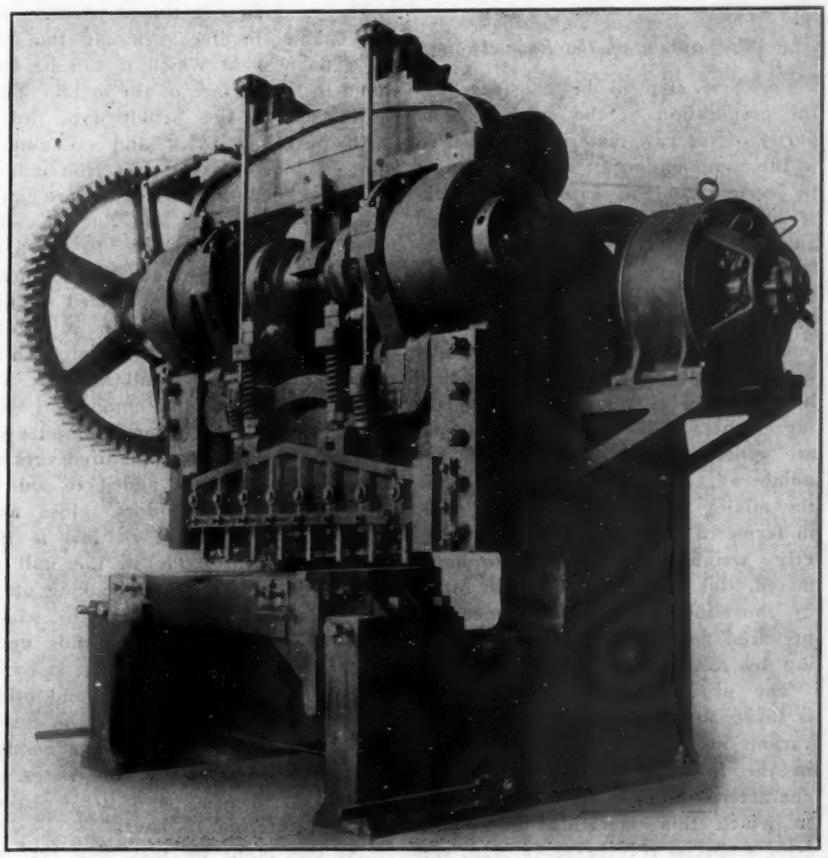


FIG. 8—ONE OF THE LARGE HYDRAULIC PLATE PRESSES

A Large Shear for Cutting Plates

A 5-foot gate shear for cutting plates up to 1¼ inches thick, designed and built by Bertsch & Co., Cambridge City, Ind., is shown in the accompanying illustration. The machine is motor-driven and is equipped with a hold-down attachment which does not interfere with the shearing operation. The hold-down feet can be quickly disengaged either for removing the top blade or for operating the shear without this attachment. In addition to the table, two heavy cross-ties are bolted to the two end housings, one across the top and the other at the rear of the cross-head, which adds to the rigidity of the machine.



FIVE-FOOT GATE SHEAR FOR CUTTING 1¼-INCH PLATES

The Acid Test of Time

That the so-called accelerated acid tests sometimes fail in giving a quick reproduction of *natural* wear, corrosion or breakdown, particularly when oxidation and the action of the elements are vital factors, is shown by a recent experience of the Carnahan Tin Plate & Sheet Co., Canton, O. A piece of tin sheeting, with charcoal iron base, which had been in service on a roof for 65 years, was immersed for 24 hours in a 25 per cent sulphuric acid solution and at the end of that time proved to be badly corroded. Before being put in the acid, however, it showed no signs of deterioration and might have had a further long drawn-out life as roofing. The conclusion reached by the experimenters, therefore, was that, in respect to such material, the only true test is the acid test of time.

The Art of Enameling Steel and Cast Iron[1]

The Ingredients Used for Making the Various Mixtures, How the Coats Are Baked, With a Discussion of How Various Color Effects Are Obtained

By Raymond F Nailler

The covering of burnt earthenware, porcelain and some metals with a crude enamel took place about the same time as the discovery of glass. That the Egyptians knew how to adorn silver vessels with enamel pictures has been recorded by Pliny the Elder. From Egypt the enameling arts were transferred to Greece and thence to Rome, and some historians maintain that the enameling art came to Italy by Arabia, Spain and the Balearic Islands, and through Roman expeditions the art passed into England, France and Germany. In the museum at Oxford is an enameled ornament which was found in Somerset, the inscription of which dates to the time of Alfred the Great.

In the history of the development of enameling or the modern industrial technology of iron enameling, we can refer to two periods with regard to the iron materials employed, namely, of the original enameling of cast iron exclusively and the latter application to sheet metal.

Before considering the technology of any particular type of enamel it will be well to consider the meaning conveyed by the word, *enamel.* If the present-day enamel be briefly and scientifically designated as a boro-sodium-potassium-aluminum-silicate generally colored by metallic oxides, then the following definition given by Popelin deserves to be quoted, since this, notwithstanding its length, may be described as most clear and comprehensive: "Enamel is a glass fusible at a low temperature and usually compounded of borates and silicates. This mixture, originally colorless, combines with the greatest ease with metallic oxides under the influence of a pyrotechnic operation, thereby acquiring various colors according to the nature of the oxide, which the enameler can vary at will."

The uses to which the general class of ceramic compounds, known as enamel, is put are varied. We have noted that enamels are used for artistic or decorative purposes. Parallel to this use we may classify a far more important type of enamels as *commercial,* and it is with this type of enamel that we are to concern ourselves. The first class of commercial enamels is that used on cast iron and this classification includes the field of sanitary equipment together with various forms of cast iron kettles and similar pieces of engineering apparatus. The enameling of sheet steel may be taken as the second class of commercial enamels. The most familiar division of this class includes cooking ware enamels. The various forms of so-called agate and granite ware as well as the single colors are made by enameling sheet-steel forms. The second class of steel enameling which has more recently come into industrial importance is the manufacture of enamel signs, and the third field includes the manufacture of heavy equipment for large scale food preparation, the dairy industries, and general chemical operations. The apparatus in this last case may take the form of tanks, kettles, evaporators, pipes, etc.

Preparation of the Enamel

The first step to be considered is the preparation of the enamel. The purity of the raw materials to be used in the compounding of an enamel must be certain and in cases where materials can vary in strength the actual analysis of the substance must be known to assure proper results. In many cases the secret of an enamel lies in its formula and so the compounding of the batches is carefully guarded, only a person of responsibility having charge of weighing the ingredients. The various materials are generally kept in bins which are numbered, the person in charge of the mixing having the formula stated in terms of these numbers. The properly weighed batch is thoroughly mixed, this being accomplished either by shoveling carefully on a specially-prepared floor or by mechanical mixing by means of a rotating agitator.

The product of the mixing room is taken to the smelter, in which the various ingredients are fused together in the form of a mass having the characteristics of glass. The furnace in which this operation takes place is of a special reverberatory type, similar to that used in the puddling process in the manufacture of wrought iron. The coal is placed on a grate at the front end of the furnace and the burning gases pass over the bridge wall, strike the roof, and are deflected against the batch. The first change which may be noted in the smelter is the driving off of the water from the borax which produces a swelling of the mixture. The fluxing materials then melt down and as the heating is continued, dissolve the more refractory constituents. If the batch is properly stirred and the temperature of the furnace carefully regulated, the product of this operation is a clear, transparent glass containing no particles of unfused material. When a test of the fusion comes up to this standard the furnace is tapped and as the liquid glass flows into a tank of cold water, it is broken up, the result being a thorough granulation of the product. The material thus prepared is known as *frit.*

The next step in the preparation of the enamel involves grinding the frit to a fineness at which it can be applied to the surface of the metal. The mill used is the pebble type lined with porcelain brick and containing flint pebbles. In the cast iron industry two general processes are employed, the dry and wet, but in sheet steel work only the wet. In the first case the frit is ground dry, the pulverized enamel being sprinkled on the hot cast iron piece. In the wet process a certain percentage of pure white clay is placed in the mill with the frit and a certain definite amount of distilled water. When certain grades of enamel are to be manufactured various compounds also are added to aid in producing desired colors, gloss and opacity. An instance of this is the addition of tin oxide in the mill in the production of white cooking utensil enamels. The fineness to which the enamel is ground depends upon the particular use to which it is to be put, manner of application and other factors. In the wet process the essential feature is that it be fine enough to remain suspended in the water assisted by the clay and the so-called *vehicles* referred to later.

At this point we may well take up the consideration of the construction

[1]Presented before the American Society of Mechanical Engineers.

and preparation of the material to which the enamel is to be applied. Cast iron enamels are applied to castings of the desired shape. In the case of cooking ware enamels the shapes are made by pressing and spinning. For heavier equipment such as jacketed kettles the apparatus is constructed by riveting or preferably welding the sheet steel in the desired form. The selection of the steel with a view to its chemical analysis is of prime importance. A reliable specification follows:

	Per cent.
Sulphur	below 0.040
Phosphorus	below 0.030
Manganese	about 0.40
Silicon	about 0.010
Carbon	about 0.10

The steel necessarily must be free from laminations or other mechanical imperfections.

With reference to the construction of heavy apparatus the sheet ranges from ⅛ to ⅜ inch in thickness. Two general methods of construction are in use: The first involves the formation of unit sections fitted with flanges. These sections are enameled separately, bolted together at the flanges and the desired apparatus constructed. The preferable practice, however, is to construct the apparatus in one piece by means of autogenous welding, thus avoiding the use of gaskets or other packing materials in erection. That the enamel may properly adhere to the surface of the metal, the latter must be free from dirt or scale and in the case of welded joints the welds must have a preliminary grinding to reduce the roughness. The entire surface of the apparatus is then cleaned by pickling or sand-blasting, the latter process being altogether used in cleaning large apparatus. As the crude ware leaves the sand blast it has a roughened, clean, metallic surface and is in the proper condition to receive the enamel.

Before applying the enamel to the metallic surface it is prepared by a process known as *setting-up*. This involves the addition of certain chemicals to the enamel as taken from the mill, the function of this addition being to assist the clay in holding the enamel particles in suspension. Substances so added are termed *vehicles*. At this stage the enamel must be diluted with distilled water to the proper consistency for application.

In applying the enamel to the metallic surface three general methods are in use: The first, applicable to small pieces only, is known as *dipping*, the pieces being dipped into the enamel, the excess of which is shaken off, leaving a thin coating on the metal. The second method, known as *slushing*, involves pouring the prepared enamel over the surface and allowing it to drain. The third method, which is the principal one used on larger apparatus, involves spraying the finely-ground enamel on the metallic surface by means of a compressed air atomizer.

Preliminary to the consideration of firing the enamel we will review the types of furnaces in use. The first type is known as the muffle furnace and involves the use of a large fire clay oven externally heated by coal, gas or other fuel. The apparatus to be fired is placed on suitable supports in this muffle. The other type of furnace is known as the direct fire furnace, in which the heat from the fire is taken up by the walls of the firing chamber and radiated to the apparatus placed within the chamber on suitable racks. This general class of furnace has two special divisions in that, on the one hand, the piece is rotated within the furnace, while on the other hand, the piece is allowed to remain stationary. For small work the muffle is in general use, but for the production of large apparatus the direct-fire furnace is necessary. At first thought, the muffle furnace may be considered to have an advantage in that the products of combustion together with the dust from the fire cannot come in contact with the enamel. Again it may seem that a more even heat can be attained in the muffle. On the other hand, with a properly-designed direct-fire furnace in which the combustion is complete before the gases reach the firing chamber, no trouble is experienced due to their presence or to the dust from the fire. The use of natural gas further does away with this latter possibility.

In a furnace for firing smaller ware the charging mechanism is fairly simple, it being necessary merely to place the material in the furnace by means of a small fork operated by hand or mechanically. But in the manufacture of engineering apparatus where a single piece may weigh 3,000 to 4,000 pounds it is necessary to have a large mechanical charging machine on which the piece may be placed outside the furnace, the arm of the machine then properly placing it in the furnace. The general design of such a machine suggests the charger used in open-hearth practice. The apparatus to which the enamel has been applied is placed in the furnace, which is maintained at the proper temperature. This temperature varies with the nature of the enamel and in cases of high silicon, acid-proof enamels reaches approximately 2,500 degrees Fahr. The control of the firing is made possible by the changes which occur in appearance of the enameled surface as fusion takes place. At first the fine particles of enamel begin to fuse together and a general blister condition exists, giving the surface a dull appearance. But as the enamel matures, this dull appearance gives way to a bright glass which, when properly developed over the entire surface, is an indication that the piece should be withdrawn from the furnace. The time required to burn a piece properly depends upon the temperature of furnace, thickness of metal and nature of the enamel.

In general there are two kinds of enamel, known as ground coats and cover coats. The former serves as a bond between the enamel and the cast iron or steel, and the latter serves to build-up the body of the enamel and presents the finished surface. In the ground coat, color is no object. Its composition is such as to render it adherent and strong. In addition to the ordinary components, cobalt oxide seems to be essential to the production of adherence. The explanation of this is debatable. The cover coat is the one which forms the major part of the enamel and if definite color, opacity, etc., are objects the necessary ingredients for their production are introduced here, assisted by mill additions.

In the manufacture of acid-proof enamel, the cover coat is essentially a high silicate and must be free from any metallic oxides, such as oxide of tin, lead, iron, etc. The piece to be enameled receives one ground coat which is burnt well into the steel at a high temperature. The cover coats may be one or two in number for ordinary enameling, but should be at least triple for acid-proof work. In the production of acid-proof apparatus, the use of a ground coat or cover coat is now eliminated and the same material which in place of being an enamel, as commonly termed, is in reality a boro-silicon glass and without the use of any metallic oxides in its compounding.

It is interesting to note the chemical changes which take place in the various stages of the production of the finished enamel. Avoiding so far as possible deep technicality, they may be summed up as follows. As a starting point let us select a cover coat formula used in the production of a *dark blue* cooking ware enamel:

Feldspar	120
Quartz	72
Borax	80
Cryolite	30
Saltpeter	7
Oxide of cobalt	7½
Oxide of manganese	1
Clay in the mill, per cent.	4

First considering the behavior of

each of the constituents when heated we can later clearly note the general reactions which take place when they are fused together in the smelter.

Feldspar varies greatly in composition, but as commonly used in enamels is an aluminum-sodium-potassium silicate of approximately the following analysis:

	Per cent.
Silica (SiO_2)	70
Alumina (Al_2O_3)	17
Soda (Na_2O)	7
Potash (K_2O)	6

On smelting, none of these constituents vaporize so we may consider them all later in the smelting of the above enamel.

Quartz introduced as a pure glass sand contains practically 100 per cent silica (SiO_2).

Borax is chemically known as sodium tetra-borate and in the crystalline form used has a certain definite amount of so-called water of crystallization which must be taken into account. The formula $Na_2B_4O_7 . 10H_2O$ is resolved into $Na_2O . 2B_2O_3 . 10H_2O$. break up into potash (K_2O) and nitrogen pentoxide (N_2O_5). This reaction is $2KNO_3 = K_2O + N_2O_5$. By calculations based on this reaction 100 pounds of saltpeter yields about 47 pounds of potash (K_2O) and 53 pounds of the nitrogen oxide (N_2O_5). The latter may be considered as completely vaporized.

Oxide of cobalt (CoO) may be taken as non-volatile and pure. The same may be assumed for the oxide of manganese (MnO_2).

The accompanying table gives an outline of the reactions taking place in the smelter.

We shall consider (see table) that the H_2O, N_2O_5 and F_2 are vaporized. This leaves the following for the constituents of the frit:

	Pounds.	Per cent.
Silica (SiO_2)	156.0	53.5
Alumina (Al_2O_3)	27.6	9.5
Soda (Na_2O)	59.2	20.3
Potash (K_2O)	10.5	3.6
Boric Oxide (B_2O_3)	29.6	10.2
Cobalt Oxide (CoO)	7.5	2.6
Manganese Oxide (MnO_2)	1.0	0.3
Total	291.4	

The loss, theoretically, on smelting

REACTIONS IN THE SMELTER

120 pounds Feldspar gives	$120 \times 0.70 = 84.0$ pounds Silica (SiO_2)
	$120 \times 0.17 = 20.4$ pounds Alumina (Al_2O_3)
	$120 \times 0.07 = 8.4$ pounds Soda (Na_2O)
	$120 \times 0.06 = 7.2$ pounds Potash (K_2O)
72 pounds Quartz gives	$72 \times 1.00 = 72.0$ pounds Silica (SiO_2)
80 pounds Borax gives	$80 \times 0.16 = 12.8$ pounds Water (H_2O) (Vaporized)
	$80 \times 0.37 = 29.6$ pounds Boric oxide (B_2O_3)
	$80 \times 0.47 = 37.6$ pounds Soda (Na_2O)
30 pounds Cryolite gives	$30 \times 0.44 = 13.2$ pounds Soda (Na_2O)
	$30 \times 0.24 = 7.2$ pounds Alumina (Al_2O_3)
	$30 \times 0.54 = 16.2$ pounds Fluorine (F_2) (Vaporized)
7 pounds Saltpeter gives	$7 \times 0.47 = 3.3$ pounds Potash (K_2O)
	$7 \times 0.53 = 3.7$ pounds Nitrogen oxide (N_2O_5) (Vaporized)
7½ pounds Cobalt oxide gives	$7\frac{1}{2} \times 1.00 = 7\frac{1}{2}$ pounds Cobalt oxide (CoO)
1 pound Manganese oxide gives	$1 \times 1.00 = 1$ pound Manganese oxide (MnO_2)

Without going through the calculations assume this to correspond approximately to the following analysis:

	Per cent.
Water (H_2O)	16.0
Boric Oxide (B_2O_3)	37.0
Soda (Na_2O)	47.0

Of these the last two do not vaporize on smelting, but the water is evaporated, hence 100 pounds of borax smelts to 84 pounds of the remaining oxides.

Cryolite is a double fluoride of sodium and aluminum, the formula of which may be written Na_3AlF_6. When smelted, the sodium and aluminum appear as oxides and from 100 pounds of cryolite we realize about 24 pounds of alumina (Al_2O_3), 44 pounds of soda (Na_2O) and 54 pounds of fluorine (F_2). There is some dispute as to whether or not the fluorine is vaporized.

Saltpeter is potassium nitrate KNO_3. When heated under the conditions of smelting it may be considered to

is plainly 317.5 — 291.4 = 26.1 pounds or $\frac{26.1}{317.5}$ = 8.2 per cent. (317.5 pounds = original weight of batch.)

The mill additions together with the agents used in *setting-up* are fused with the frit as the piece is fired. By a process similar to the one outlined, we would compute the final composition of the enamel by taking these additions into consideration. The actual amount of material added in this case, however, is so slight and of such a nature that the change resulting therefrom is not sufficient to affect materially the composition of the enamel. When an addition of about 12 per cent of tin oxide accompanies the clay, a significant change in the composition of the enamel is produced.

It may be well to note some of the means by which various colors are produced in the enameling industries. The production of a white enamel, either for cast iron or sheet steel work may be said to depend, at the present time, upon the use of tin oxide. Great have been the efforts to substitute less expensive substances, such as compounds of antimony and lead. But an antimony white which looks good alone is plainly seen to be off-color when compared with a good tin oxide white.

Going to the other extreme of color, black, we encounter difficulties. There is any number of formulae for black enamels, but when the results are closely compared we find that the colors range widely through brown blacks, blue blacks, purple blacks, etc. Certain compounds of manganese and iron used together give a color approaching black. Other formulae call for the combined use of oxides of manganese, cobalt and copper. Again we find oxide of nickel added to the above three oxides.

A color much seen in enamels is blue and the use of cobalt is satisfactory in the production of this color in various grades of intensity. Manganese alone produces purples and violets and in combination with cobalt gives various shades of purple-blue.

Green enamels are chiefly produced by the use of chromium oxide and copper oxide, while in some cases a mixture of copper and cobalt oxide is used.

Reds of various shades are produced by the use of red oxide of iron. In connection with it we find that tin oxide aids greatly in giving opacity and bringing out the color. In the production of brown enamels we may use ferrous chromate. Various yellows are produced by salts of cadmium, chromium and uranium.

The more delicate shades of rose and purple are produced by the use of gold compounds. So-called "pink-rose" is used in the manufacture of certain artistic enamels. Perhaps the best known gold compound used in enamel coloring is "purple of Cassius". The exact composition of this product is a question. It is made by the combined use of auric, stannous and stannic chlorides. The color produced is also commonly called "purple of Cassius".

A comparison of the figures of production of asbestos in the United States for 1911 and 1912 shows that the output for 1912 was considerably less than that of the previous year, yet, notwithstanding this fact, the production for 1912 was the largest in the history of the industry, except that of 1911. The production in 1912 was 4,403 short tons.

Concrete Piles for Strengthening Foundations

At the Esch-sur-Alzette works of the Burbach-Eich-Dudelange Co., Luxemburg, Germany, it recently became necessary to strengthen the foundations of a blast furnace, owing to the replacement of the old stack by one twice its size. The completed work and the superstructure are shown in Fig. 1.

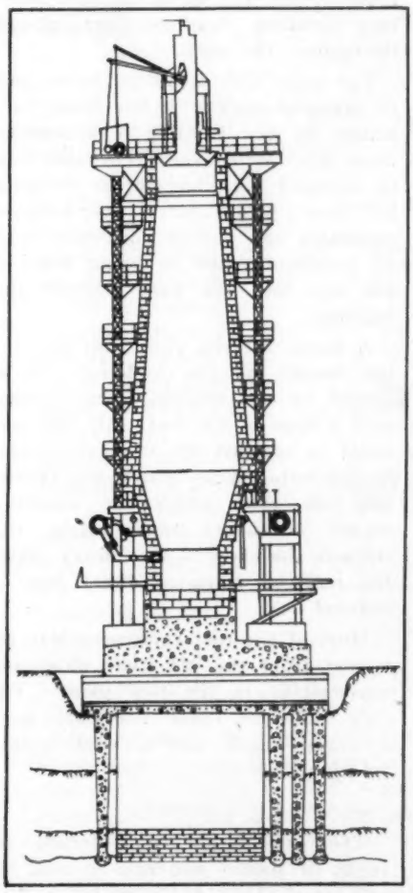


FIG. 1—HOW THE FOUNDATION OF A BLAST FURNACE AT ESCH-SUR-ALZETTE WAS STRENGTHENED WITH CONCRETE PILES

The masonry sub-foundation of the old furnace rested on gravel 42 feet below the surface of the soil, and the ground had been built up entirely with loose waste. Several break-outs from the surface had penetrated this packing and in the new excavation work masses of iron and slag were encountered, showing the unreliable character of the ground for a foundation.

To strengthen it, 41 concrete piles, each calculated to sustain a load of 70 tons, were driven, or rather built-up, outside of the masonry and a concrete slab arch constructed to rest both on the masonry and the piles, with a layer of granulated, crystalline slag and cement in between as a buffer and binder. The arch was topped with the usual concrete surface foundation bearing the brickwork of the hearth and the column supports of the stack, charging apparatus, etc.

In this re-construction, the feature of greatest interest, as brought out in a paper read by Armand Baar, of Liege, before the Iron and Steel Institute of Great Britain, was the driving of the concrete piles, on what is known abroad as the Franki system, as follows:

"A conical boring shield, with hardened steel point, was driven to the necessary depth by means of a pile driver, and this carried with it telescopic tubes of 27 inches average diameter. The shield was then withdrawn and replaced by concrete, which, in being rammed down, pressed outward into bulbous shape, so as to give the built-up pile a large bearing surface at the bottom. At the same time the ground between piles was compressed and thereby made much firmer. The telescopic tubes were then withdrawn, one by one, commencing at the bottom, and the spaces left by them rammed with concrete until a strong monolithic pile had been built-up. Since completion, the furnace has been in regular operation and the foundation shows no signs of settlement."

Another interesting application of

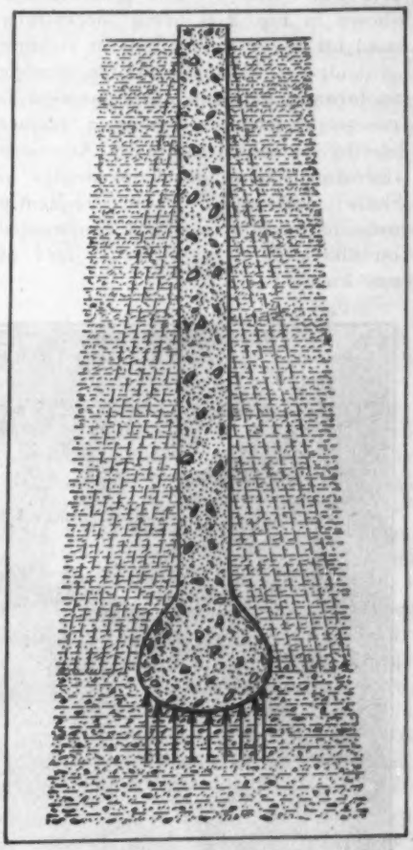


FIG. 2 — TYPE OF PEDESTAL CONCRETE PILE USED FOR HEAVY FOUNDATIONS IN YIELDING GROUND

the same system of piles was made in erecting the rolling mills of the Ougree Marihaye Co., at Ourgee. The whole plant, whose level is 35 feet above an adjacent river, rests on 180 piles, which were driven through a 30-foot slag dump and 15 feet of soft subsoil to gravel. Before carrying out this work the company tested a single pile, which bore up a load of 473 tons. The Athus-Grivegne Co. erected a plant at Athus under similar condition. These piles have also been successfully used as foundations for gas engines at the works of the Societe Metallurgique de la Basse Loire, at Trignac-St. Nazaire, of the Acieries de Micheville in Meurthe-et-Moselle and the Societe Anonyme des Hauts Fourneaux de la Chiers at Longwy.

First Use

The first concern to try the system, however, was the Cockerill Co., Seraing, which has used it at a number of installations, including the foundation of an exceptionally large gas holder, and up to the present time more than a thousand such piles have been driven for the company.

The idea is not new to this country, where the *pedestal* concrete pile shown in Fig. 2 is being successfully used for heavy foundations in yielding ground; but its application in Europe to furnace, mill and other metallurgical works construction is a feature worthy of consideration by American operators having problems similar to those mentioned. These frequently arise in relation to plants constructed on alluvial bottoms or *made land* of any kind.

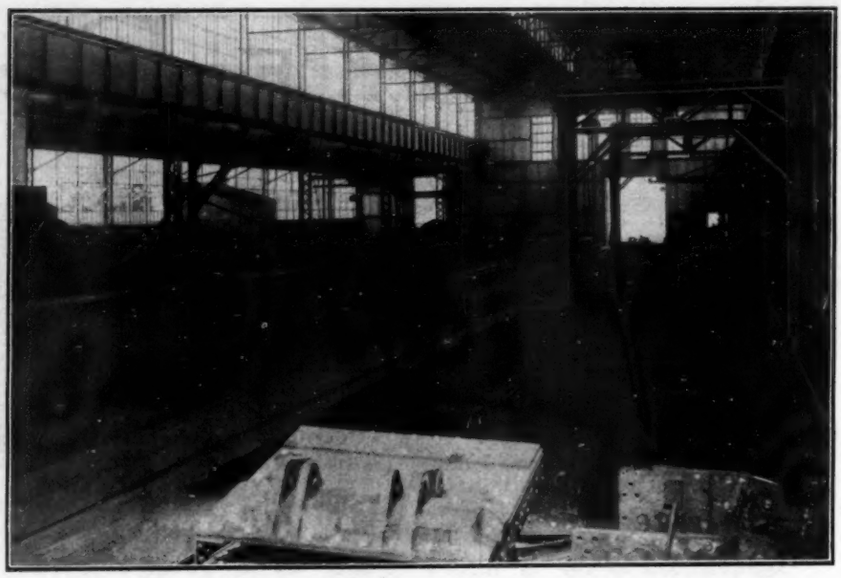


FIG. 2—ANOTHER VIEW OF THE SHOP, SHOWING THE STEEL GALLOWS FOR HANDLING HEAVY PLATES

The Bucyrus Co.'s New Plate Shop

In the fall of 1912 the increased business of the Bucyrus Co., South Milwaukee, Wis., rendered it necessary to add a new plate shop to its extensive plant. This was accomplished by acquiring property directly north of the works and laying out a shop in such a manner that it can be practically trebled in size when necessary. The present building, which is 94 x 280 feet, can be extended eastward and duplicated to the south.

The building is entirely fireproof in construction, being steel and brick throughout with steel sash, tile roof and cement floor. It is heated by exhaust steam, using the Webster vacuum system together with a large Sturtevant fan. The building is exceptionally well lighted and the sanitary arrangements are complete; hot and cold water is installed in the toilet rooms and lavatories and sanitary drinking fountains are placed throughout the shop.

The main aisle is 60 feet wide and is equipped with a 25-ton crane furnished by the Pawling & Harnischfeger Co., Milwaukee. The side bay is equipped with an electric walking jib crane which serves its purpose admirably and has an advantage over an overhead crane in being able to run out into the yard beyond the building.

A large material yard runs the entire length of the building. It is served by an electric gantry crane with a span of 130 feet. All raw material is handled by the gantry and loaded onto trucks which are shifted into the shop under the overhead cranes. Standard gage tracks run through the shop so that heavy material may be unloaded direct from a railroad car.

Most of the tool equipment was removed from the old plate shop and reassembled in the new plant. The only additions found necessary were a heavy punch and a small rotary splitting shear.

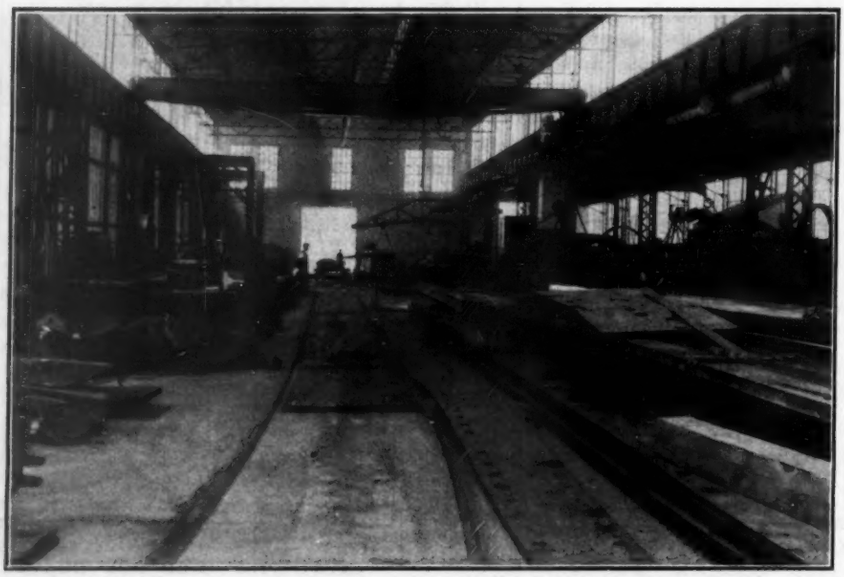


FIG. 1—MAIN AISLE IN THE BUCYRUS CO.'S NEW PLATE SHOP

The zinc output of Colorado (in terms of spelter and zinc in zinc oxide) was 132,222,812 pounds in 1912, as compared with 94,607,456 pounds in 1911, an increase for 1912 of 37,615,356 pounds in quantity and of $3,730,749 in value.

Blast Furnaces Planned for New York District

Plant to be Located at Boynton Beach, N. J., 17 Miles from Manhattan Island, and Will Include Two Stacks and a Battery of By-Product Coke Ovens

New York harbor is destined to become of considerable importance as a pig iron producing center if several projects now under consideration mature. Influences which will exert a marked bearing upon the industrial character of the metropolitan district from an iron-making standpoint include the establishment of improved methods of transportation. The two most prominent factors of this character are the approaching completion of the Panama canal and the enlargement of the New York State barge canal. At present plans are being considered by interests already closely affiliated with the iron and steel industry for the erection of a modern blast furnace plant in New York harbor. In making these plans, full weight was given to the changing conditions of the locality from a transportation standpoint. This project has advanced so far as to make its accomplishment a definite probability of the near future. A group of capitalists prominent in the iron and steel industry, among whom are Witherbee, Sherman & Co., iron ore operators in the Port Henry district of New York state, has taken an option upon a manufacturing site in the harbor which possesses unusual advantages from a pig iron producing standpoint. This site is located on the inner harbor along Staten Island sound off the Raritan and the lower bay on the New Jersey side. It is approximately 17 miles distant, by direct water route, from the Battery, the southernmost point of Manhattan island. The location embraces what is known as Boynton Beach, N. J., lying between the towns of Perth Amboy and Sewaren, as shown on the accompanying map, and has excellent transportation facilities. The channel of the sound at this point is 21 feet deep at low water and immediately in front of the property the channel is 29 feet deep. In the near future, it is probable that the channel will be dredged by the government to a depth of from 30 to 35 feet. Many foreign freighters now dock at the numerous industrial plants located along the shore in the immediate vicinity. The site comprises 175 acres and has a frontage of 1,680 feet on the sound and 600 feet on Woodbridge creek, giving it a total dock frontage of about 2,300 feet. Three-fourths of the site is from 16 to 20 feet above high tide. Test drilling upon the property indicates a good supply of fresh water which, in connection with the Woodbridge creek, will more than meet the requirements of a blast furnace plant. The New York & Long Branch railroad of the Central Railroad of New Jersey operates through the property. The Pennsylvania, Lehigh Valley and Philadelphia & Reading railroads are upon the outskirts of the site and will require very little extension to directly serve any plant that may be built thereon. In fact, the site is practically reached by four trunk lines. The tentative plan contemplates the erection of two merchant blast furnaces with a daily capacity of about 400 tons each. These furnaces will be calculated to serve a rich consuming territory, especially in the immediate metropolitan district, lower Hudson river points and New England. Within the territory covered by a radius of 100 miles of the location, it is estimated there is a normal consumption of approximately 750,000 tons of merchant pig iron annually. This estimate does not take into account the requirements of steel-making iron purchased by eastern Pennsylvania steel works. Furthermore, the site is especially well located for export business, which, to all indications, will enjoy a substantial increase upon the opening of the Panama canal. Some thought has been given to the establishment of a cast iron pipe plant in connection with the furnaces, for the utilization of a considerable part of the output. New York City alone is a heavy buyer of cast iron pipe and there is a good market for this prod-

MAP OF THE NEW YORK HARBOR, SHOWING THE SITE OF THE PROPOSED BLAST FURNACE PLANT AND ITS LOCATION RELATIVE TO MANHATTAN ISLAND

No. 1, site of the proposed blast furnace plant; 2, works of the C. Pardee Co.; 3, Chrome Steel Co.; 4, Milliken Bros., Inc.

uct throughout the territory which would be served by a pipe foundry at this point, not to speak of the possibilities for export trade. The furnace slag is expected to command a positive value both as a filling material for the making of valuable land in New York harbor, for which there is a heavy, steady demand, and for the manufacture of Portland cement.

The location selected for the furnaces has marked advantages in its accessibility to various ore fields, both domestic and foreign. Furnaces with such a position on tidewater would be enabled to take foreign and some domestic ores, such as from Texas, without any inland haul. Blast furnaces in eastern Pennsylvania and other eastern seaboard zones now using foreign ore, add from 80 cents to $1 a tone to the iron costs, because of this inland haul. Last year, eastern Pennsylvania furnaces bought and imported about 1,000,000 tons of iron ore mined in Cuba, Sweden, Spain, Newfoundland, Nova Scotia, Venezuela and in other foreign countries, and during the past five years they have used at least 5,000,000 tons of such ores. These estimates do not include the heavy importations of Cuban ore by the Pennsylvania Steel Co. and the Bethlehem Steel Co. from their own holdings on that island. Furthermore, in shipping pig iron back to the metropolitan or to other consuming districts to the east or northeast of their plants, the freight of eastern Pennsylvania producers averages from 70 cents to $1.05 a ton. It, therefore, is apparent that furnaces on tidewater obtaining their ores without inland haul and shipping their pig iron into local territory or into districts to the north and east of their plants, possess an advantage in freight of from $1.50 to $2 a ton over eastern Pennsylvania stacks. Similarly they would be more favorably situated than Buffalo furnaces for water delivery to Long Island sound and New England tidewater points now reached by canal.

Barge Canal Shipments

What apparently will be of greater advantage to these furnaces on tidewater, however, will be the completion of the New York state barge canal. By this method of transportation it is expected that Lake Superior iron ores may be brought from Buffalo and landed at New York harbor at a considerably less cost than to furnaces in the eastern Pennsylvania district, either at the latter's present all-rail rate or later by a water and rail rate. When the enlarged Erie canal from Buffalo to Albany, now in progress, is completed, it is expected that a rate of from 50 to 75 cents a ton on ore will be made from Buffalo to New York harbor. The striking situation would then be presented of New York harbor receiving Lake Superior ore at a cheaper price than the Pittsburgh district under the latter's present rate of 88 cents from lower lake ports.

Champlain Canal

The opening of the deepened Champlain canal between Port Henry and Troy, N. Y., however, offers an even more favorable base of ore supply through the Port Henry district. The construction of this enlarged waterway is now in an advanced stage and promises to be completed in about a year or more, or in about the time required to erect and place in operation a modern blast furnace plant of the type planned. The Champlain canal will be 73 feet wide at the bottom and 125 feet wide at the top, except in rocky sections, where it will be 94 feet wide at the bottom. It will have a navigable minimum depth of 12 feet. It is proposed to use barges 275 feet long by 30 foot beam, which will have a single load capacity of 1,500 to 2,000 tons of ore. At the present time the Champlain canal is only capable of handling barge lots up to 150 tons. The distance by water route from Port Henry to the site of the proposed furnaces is 275 miles by all water route. The course will be from Port Henry to Whitehall, by way of Lake Champlain, then through the Champlain canal a distance of 22 miles to Fort Edward. From that point the Hudson river, which has been canalized to Troy, a distance of 49 miles, will be used and the rest of the trip will be down the natural course of the Hudson river. It is expected that a rate of 50 cents or less from Port Henry to New York on ore will be provided by this route. This would mean a cost of at least 2 cents per unit cheaper in the average than the same ore is now being delivered to eastern Pennsylvania furnaces. The Port Henry district, at the present time, is producing approximately 900,000 to 1,000,000 tons annually and a vast body of undeveloped ore has been proved-up in that territory, so that the extent of the deposits would present no problem as to the permanency of the cheap ore base. A wide range of pig iron grades is made possible by the use of the Port Henry ores and concentrates. At the present time, foundry, basic, Bessemer and malleable grades of iron are being made from these ores. Present developments in this district will furnish ore suitable for the manufacture of low phosphorus pig iron and with the tailings there available, basic-Bessemer iron could be produced, provided there was a demand for it.

The fuel problem is to be solved by the erection of a by-product coke plant which will have an output of about 1,000 tons a day. There is a population of 1,000,000 people within 25 miles of the proposed site, which would offer an ample market for the disposal of the waste gas of such a plant. The railroads that serve this site, tap the rich coal fields of eastern Pennsylvania and afford every facility for obtaining material for coke oven operations. It is proposed to use the waste gases of such a plant for generating power. Limestone of good quality can be obtained within a reasonable shipping distance of Boynton Beach in New Jersey or along the Hudson river. Labor conditions are reported to be favorable among the numerous industries within the zone where the proposed site is located. The fact that the property is without the limits of New York City adds to its advantages.

The tract of land selected for the furnaces is one of the best industrial sites in New York harbor. It is in the center of a tidewater manufacturing district of great importance, which embraces a number of large plants engaged in various industrial pursuits. Some of these are directly connected with iron and steel and metal industries. Among the plants in the district are the following: Chrome Steel Co., Chrome, and the C. Pardee Works, Perth Amboy, N. J., both of which have open-hearth steel plants; Vulcan Detinning Co., American Smelting & Refining Co., United Lead Co., Electric Smelting & Aluminum Co., Balbeck Smelting & Refining Co., Standard Oil Co., Grasselli Chemical Co., Ostrander Fire Brick Co., Maurer Brick Co., Valentine Brick Co., and the Barber Asphalt Co.

Near Defunct Plant

Within a short distance of the site of the proposed furnaces is located the open-hearth steel plant, structural mills and bridge shop of Milliken Bros., Inc., which failed in 1907. Since that time only the bridge shop of this plant has been operated. One of the causes commonly ascribed for the failure of this plant and the inability to profitably operate the steel works, has been the high pig iron costs. It is believed that the establishment of modern furnaces within barge limits to this point may eventually contribute to the rehabilitation of this plant and to the growth of steel-making in New York harbor.

THE ABC OF IRON AND STEEL

Wire and Wire Rods—III

By Kenneth B Lewis

The dry house is deserving of further consideration. Baking performs three distinct functions: First, it dries the rods before their wet coating has had time to rust them; second, it seems to promote the formation of lubricating compounds between the surface of the steel and the lime itself, and, third, as already explained, it is valuable in combating the influence of hydrogen occluded, or absorbed by steel during cleaning. This is particularly true of high carbon rods, which are more liable than the softer stock to acid brittleness.

A modern dry house is generally divided into separate alleys through which the trucks move continuously in the same direction. The alleys have doors at both ends so that a truck entered from the cleaning house may discharge directly into the wire mill. In regard to the temperature, it would naturally follow that more heat means less baking necessary to secure a given result. The relation between temperature and time in this connection has not been sufficiently studied. High temperatures have been difficult to maintain owing to primitive heating arrangements, and there has grown up among mill men a belief that temperatures above 300 degrees Fahr. are apt to *burn* the lime, robbing it of its lubricating value. The belief has grown up mainly because a hot dry house, as houses have generally been built, is a house with one or two extremely hot spots rather than an even, high temperature. Dry house design has been hitherto much neglected, but is now receiving some attention from builders of wire drawing equipment, and experiments now in progress indicate that higher temperatures and faster working, accompanied by a much better fuel economy, may be confidently expected.

The wire may be subjected repeatedly to the drawing operation through smaller dies until it has reached the required size. This is true only to a limited extent. The wire becomes hard and brittle as its tensile strength increases from cold working and rapidly ap-

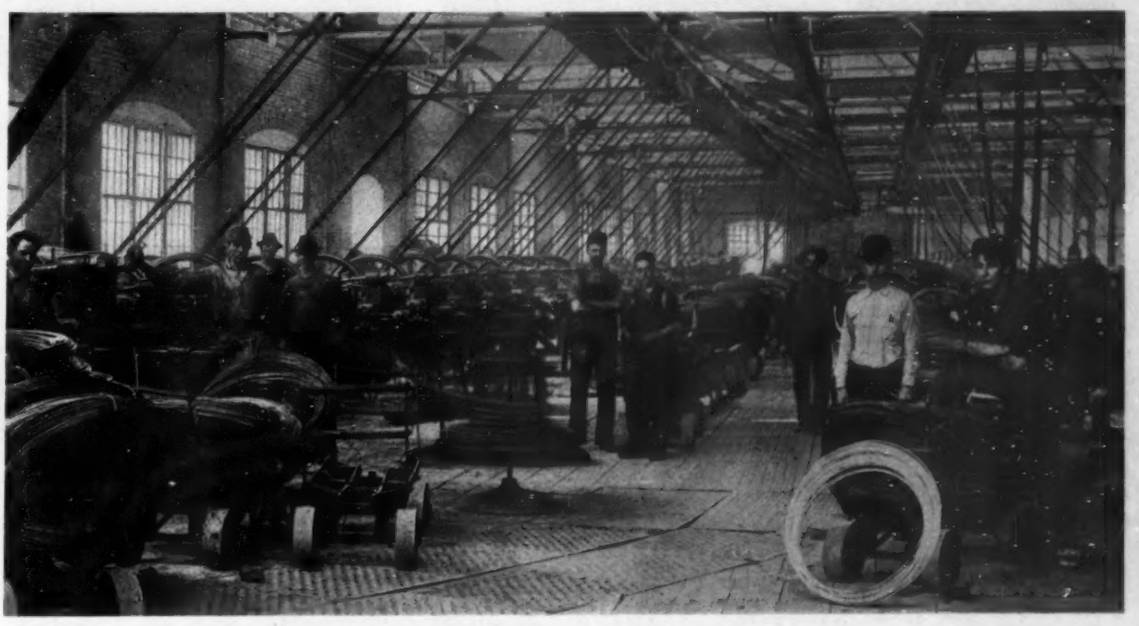


FIG. 15—INTERIOR VIEW OF A WIRE NAIL PLANT

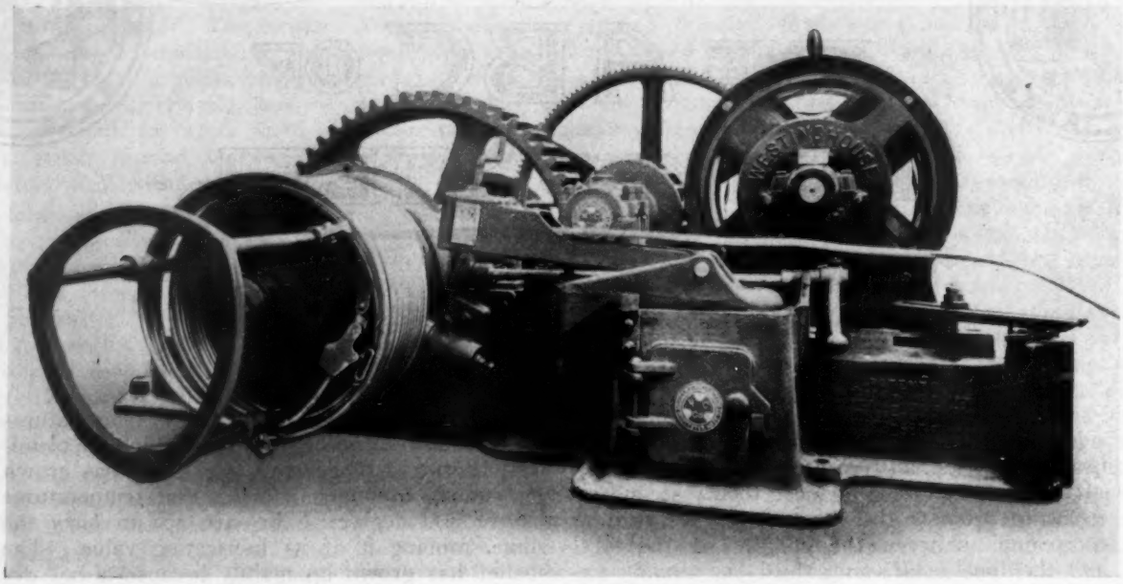


FIG. 16—A HORIZONTAL SPINDLE "BULL FRAME" DRAWING WIRE 7/8 INCH IN DIAMETER

proaches a condition in which it could neither be drawn further nor worked in machines. It may be restored by annealing at a red heat somewhat below the critical range. This heating, as it results in scaling of the steel, must be followed by cleaning and coating exactly as in the case of rods. The annealing is sometimes done in the muffle furnace in which the bundles are acted upon directly by the flames from a soft coal fire, and sometimes in pot furnaces in which the bundles are packed in large cylindrical iron or steel pots, securely sealed and heated by coal fires in the lower part of the brick furnace into which the pot is placed.

Another form of annealing to which high carbon wire is generally subjected is the so-called *patenting* process in which the wire uncoils from a reel, passes through a long furnace in a single strand and then is coiled again upon blocks very similar to wire drawing blocks. Twenty or 30 of these strands run through the furnace side by side. Issuing from the end of the furnace the wire is rapidly cooled by the air from approximately 1,800 degrees Fahr., which causes the steel to assume the sorbitic structure. In other words, treated in this way the wire assumes that physical condition which gives it the best working combination of tensile strength and toughness. In this condition it may be subjected to heavier drafts than if annealed in

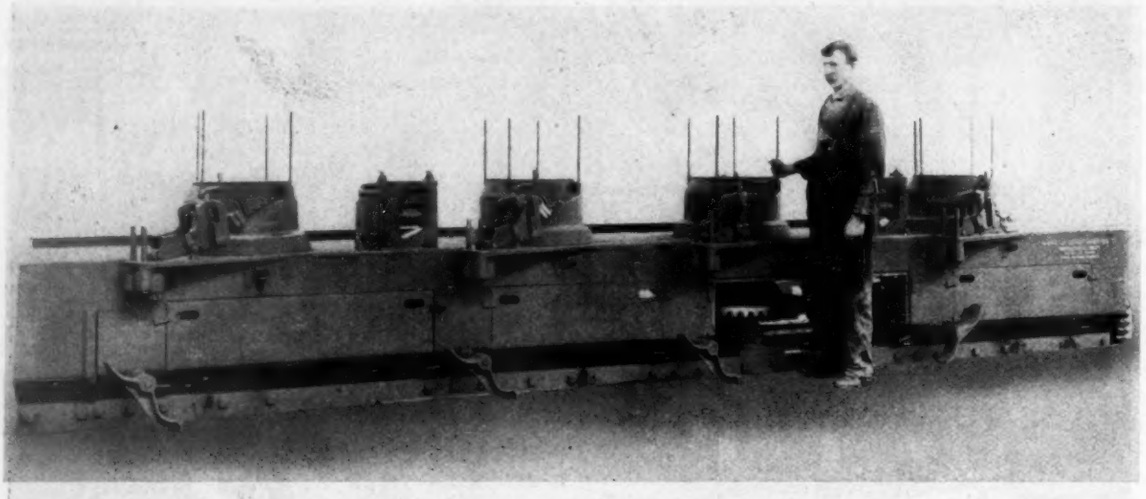


FIG. 17—HEAVY ROD BENCH BUILT BY THE MORGAN CONSTRUCTION CO., WITH FOUR FRICTION CLUTCH BLOCKS. THIS VIEW SHOWS THE POINTERS MOUNTED ON THE BENCH

the ordinary way, and, after drawing, is in excellent condition to stand severe treatment on wire forming machines. It also has the combination of physical properties most desirable in rope wire, piano wire and many varieties of springs. For the accurate temperature control required in the patenting of rope wire and some other high carbon products the wire leaving the patenting furnaces plunges into a bath of molten lead maintained at a temperature of approximately 800 to 900 degrees Fahr. The resulting structure is the same as would be obtained by air-cooling, but is more uniform and dependable.

Annealing is resorted for the purpose of restoring hard drawn wire to its original condition so that further drawing may be performed upon it. It also is done in order to produce soft wire to meet the requirements of various consumers. The product may be sold as annealed wire, annealed and cleaned wire, or bright-annealed, this last term meaning wire carefully pot-annealed in such a way as to reduce oxidation to a minimum.

The amount of reduction per draft varies from about 40 to 10 per cent of the original section, depending on the composition of the metal, condition of the particular lot of wire as observed by the wire drawer or foreman, or the physical properties desired in the finished material. There is a limit to the amount of drafting that steel wire will stand without permanent impairment of its physical properties. Rope wire, for example, is carefully studied with regard to the effect of various drafting schedules on its final quality. With soft Bessemer and basic steel, on the other hand, it is permissible, within reasonable limits, to draft about as heavy as the stock will stand without breaking. The same is true of drawing speeds, which vary generally from 200 to 450 feet per minute. The care with which cleaning, coating and baking have been performed has a large influence on the amount of draft and speed that wire will stand, as well as the number of drafts possible between annealing points.

The drafts between annealing points is not entirely dependent on the structure of the steel itself, but may be limited by the fact that the lubricating coat produced on the rod in the first draft will not do duty indefinitely. If the rods are properly handled in the cleaning house the coating will outlast the physical soundness of the wire, but it is a common experience for a foreman to be compelled by the scratching of the wire on the second or third draft to divert it from its intended use, anneal, reclean and find among his orders some size and temper into which wire annealed at that point can be drawn.

When wire is drawn smaller than about 20 gage (0.035 inch) it is generally found advisable to resort to *wet drawing*. After the last process annealing and cleaning, the wire, instead of being lime-coated, is dipped into a solution of sulphates of tin and copper. It becomes thinly covered with a metallic coat of tin and copper which, upon drawing, acts as a lubricant and remains on the wire, giving it a nicely polished straw-colored surface. By way of further lubrication, the reel from which the wire uncoils is set into a tub partly filled with an emulsion of rye meal in water, in a state of fermentation. The color of the coat may be varied from steel white to copper red, by varying the proportions of tin and copper in the solution. This process is more effective than any other in the smaller sizes, but is also frequently resorted to in larger wire for the sake of the pleasing finish obtained. Such wire takes nickel-plating nicely and is also desirable for tinning.

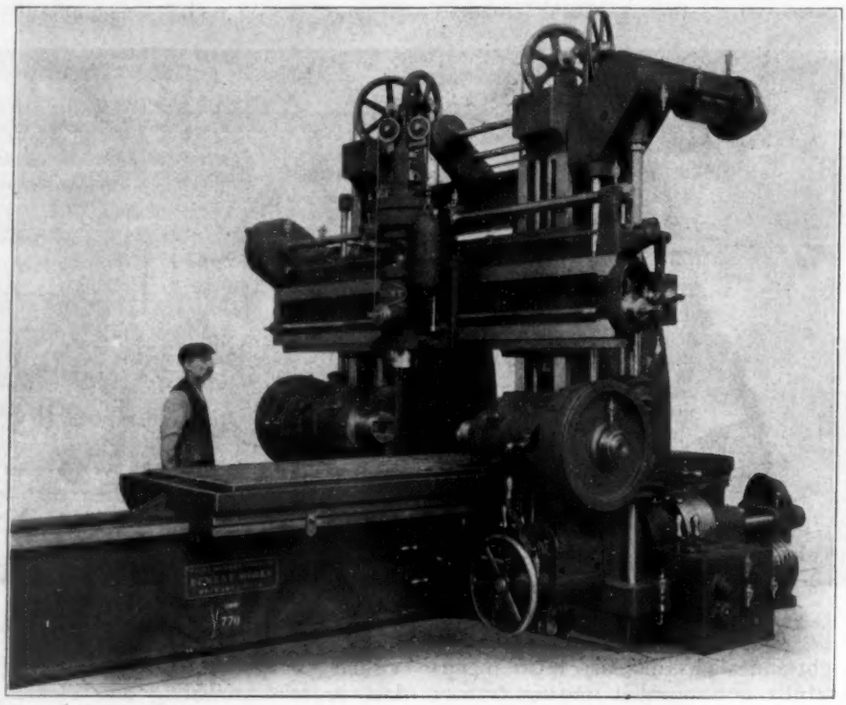
FIG. 18—INTERIOR VIEW OF A WIRE DRAWING PLANT

Milling Operations Simultaneously Performed

By S. R. Stone

To meet the requirements of heavy machinery, where several operations can be performed simultaneously, the Niles-Bement-Pond Co., New York City, has designed a milling machine, provided with three spindles, one vertical on the cross rail and a horizontal spindle on each upright, as shown in the accompanying illustration. It has a capacity to mill 48 inches wide, 37 inches high, and 12 feet long. The maximum distance between the center of the horizontal spindles and the top of the table is 24½ inches.

All spindles are 4 inches in diameter through the driving worm-wheels, 5 inches in diameter in their main bearings, and have heads 7½ inches in diameter. The spindles revolve in quills, 8 inches in diameter. Driving slots are planed across the ends of the spindle heads for receiving the tongues and mandrels or cutters. The spindles have central holes running through their entire length, which are used for drawback bolts to keep the cutters, or mandrels, rigid within their taper sockets. Each spindle is provided with a separate clutch for engaging and disengaging the drive. They are driven by bronze worm wheels of coarse pitch and steel worms with roller thrust bearings. No spur gearing is used at the spindle heads for driving, thus eliminating chatter.



THREE-SPINDLE MILLING MACHINE BUILT BY THE NILES-BEMENT-POND CO.

The vertical head is provided with reversible automatic feeds across the rail and also power rapid traverse. This feature permits the finishing of cross grooves and surfaces that cannot be accomplished by the table feed.

The cross rail is reinforced at the top by a rib cast integral with it and is counterweighted, being raised and lowered by power from the driving motor.

The side heads have reversible automatic feeds up and down the posts for vertical milling. The two heads can be fed independently or together. When connected to feed in unison, a slabbing mandrel may be extended from one head to the other. With this arrangement, vertical faces can be finished. The side heads are counterweighted and have power traverse on the posts operated by a driving motor.

The Table

The table is fed by a spiral rack and pinion, the latter running in an oil pocket. In addition to automatic feeds, the table is provided with power rapid traverse, as well as fine hand adjustment. The power feeds for the table vary from 0.222 to 28.6 inches per minute. The table is provided with a trough cast around it for collecting the chips and draining the cutting fluid to the tank, from which it is pumped through piping to the milling cutters.

This machine is driven by a 25-horsepower, 3 to 1, direct current motor, giving horizontal spindle speeds varying from 7.18 to 72.57 revolutions per minute and vertical spindle speeds from 8.18 to 92.73 revolutions per minute.

A large machine of this type, with two vertical spindles, in addition to the two on the upright, was recently installed by the General Electric Co., Schenectady, N. Y., for milling the bodies of turbo-generator rotors, which are large alloy steel forgings.

An idea of its capacity may be gained from the fact that the distance between posts is 74 inches and the maximum height from the end of the spindles to the surface of the table is 61½ inches. The bed is 48 feet long and carries a table 24 feet between end pans. The machine is driven by a 50-horsepower motor. The table has reversible automatic feeds through spiral rack and pinion. It also is provided with power rapid traverse.

The face of the cross rail is 24 inches wide and the length is such that the left hand head can mill the full width between housings. The rail is provided with vertical feeds as well as power traverse on the uprights.

The spindles are 8½ inches in diameter in the bearings and 12 inches at the head. Each spindle has a separate clutch for engaging the drive. Lower mandrel bearings are provided, which are adjustable in unison with the spindles. A 2-horsepower motor drives a pump which can supply 18 gallons of cutting fluid per minute. At the time the writer inspected this milling machine, it was working on a steel forging 22 feet long and 4 feet in diameter, which weighed 65,000 pounds in the rough. The operations simultaneously performed were effecting an appreciable economy in time and consequently in finishing costs.

For many years North Carolina has been the largest producer of mica in the United States, according to the United States geological survey. Prior to 1895 the output came briefly from the larger mines and consisted of big sheets of fine quality. At that time large quantities of small sheet mica that would cut plates less than 3 inches square were thrown on the dumps as waste. After the small sheet and scrap mica became valuable, the dumps at the large mines were worked over and the quantity of mica produced was thereby greatly increased. Now that most of the dumps have been worked over and only a few large mines are in operation, the output is barely maintained by a large number of small mines.

IRON AND STEEL MARKETS

False Rumors of Low Prices Cause Depression

Steel Corporation Will Not Reduce Quotations Except to Hold Trade on Pacific Coast—Still Figuring on Effects of New Tariff

BY GEORGE SMART

Persistent rumors that the Steel Corporation would soon announce important reductions in prices of leading steel products have caused many buyers to defer placing orders and the volume of business has been greatly reduced. These rumors have, however, proved to be without foundation, except so far as the Pacific coast is concerned. The order books of the Steel Corporation are in much better condition than those of most of its competitors, and its orders for this month are running ahead of those for the same period in September. Hence the Corporation is not anxious to reduce prices and there seems to be no probability that there will be a general reduction. Independents, however, are shading on various products and some very low prices have been named.

Tariff Talk

Discussion as to the probable effects of the tariff continues. Naturally it is expected that if an invasion of foreign products comes, it will be seen first on the Atlantic and Pacific coasts. Some conditions are particularly favorable for landing foreign products on the Pacific coast. That the American manufacturers do not intend to give up the Pacific coast trade without a fight is evident, as the news comes from San Francisco that the Steel Corporation has made a new schedule of steel bar prices, reducing the price for San Francisco delivery to $35 per ton, or equivalent to about $22 per ton, Pittsburgh. This is a reduction of $6 per ton. Investigation as to the possibility of importing pig iron continues, but it is evident that English iron is from 75 cents to $1.50 a ton, delivered in this country, above the prices of American irons. Very little is heard of attempts to import finished products in the east.

Pig Iron

Shipments of pig iron to foundries continue heavy, but the tonnage moving to steel plants is considerably reduced. Stocks in the yards of the members of the Eastern Pig Iron Association declined 10 per cent in September. Southern prices are strong, but the $11 quotation has not disappeared.

Structural Material

Only a fair tonnage in structural material is being placed and very low prices are being made on fabricating and erecting. In eastern territory, at least two companies are selling at 1.35c, Pittsburgh, but the general selling price is 1.40c, and small lots are sold at 1.45c. In plates, 1.35c is more easily done than on shapes. The Florida & East Coast railroad is still figuring on two steel car floats, which will require from 6,000 to 8,000 tons of steel, largely plates. The demand from car companies for plates does not represent a very large tonnage at present.

Railroad Buying

Railroad bridge work pending in the east amounts to nearly 20,000 tons, including 6,500 for the Lackawanna, 4,000 for the B. & O., 4,000 for the Norfolk & Western and 1,400 for the Lehigh Valley. The Chicago & Northwestern has purchased 1,000 steel cars from the American Car & Foundry Co., and the same number from the Western Steel Car & Foundry Co. Inquiries pending in the west include 2,000 gondolas for the Missouri Pacific, 1,000 steel coal cars for the Burlington and 500 gondolas for the Mobile & Ohio. The Havana Central has placed 3,000 tons of rails with the Bethlehem Steel Co. Street railways in Tokio, Japan, have given 3,500 tons of girder rails to the Lorain Steel Co. Rail negotiations continue active both in the east and middle west.

Sheets

The sheet market is weaker and has dropped $1 below recent minimum quotations. In eastern territory, price shading is more common, and in some cases shipments are being held up.

Bars

In the Chicago district, some weakness has developed in steel bars, and Chicago mills, instead of adding the Pittsburgh freight, are absorbing a part of it and are selling, in some cases, on the basis of 1.35c, Pittsburgh. In other parts of the country, the steel bar price is being firmly adhered to. Bar iron is low and dull and is selling at 1.25c, Chicago. Some of the iron mills have difficulty in getting enough orders to keep the plants in operation.

Scrap

The scrap market continues to decline to surprisingly low quotations. Prices have been marked down at Pittsburgh, Chicago, Cleveland and other sections. The prospect is that the slump will continue.

Wire

Some independent manufacturers have been quietly selling wire products $1 a ton under the prevailing market. Efforts of the leading mills to maintain nails on the basis of $1.65 have failed and some makers are quoting $1.60 on nails and $1.40 on plain wire.

General Lack of Demand at Pittsburgh

With More Price Irregularities — Pig Iron Slightly Weaker—Prices of Old Material Decline

BY C. F. WILLIAMS

Office of THE IRON TRADE REVIEW,
2148-49 Oliver Bldg.,
Pittsburgh, Oct. 14.

Manufacturers and consumers of iron and steel products are anxiously awaiting developments indicating the trend of the future market. In the meantime, conditions continue decidedly quiet and somewhat uncertain. The new tariff law has not been in effect long enough to affect general business to any great extent one way or another, but optimistic expressions by high officials in the trade lend the impression that no lasting ill effects will result from lower duties. How long the period of re-adjustment will extend, and to what extent prices will decline are unknown. Mills continue to operate at approximately full capacity, but managers are seeking additional tonnages more actively than at any time this year. The market this week has witnessed another decline of $1 in wire products, further irregularity displayed by steel sheets, some shading of pipe discounts, rather sharp reductions in scrap prices, and a lack of demand for all materials.

Pig Iron.—The market is dull, shows no signs of immediate activity, and prices appear slightly weaker. The Allegheny Steel Co. has bought 500 tons of basic at $14, valley, apparently the top of the market, in addition to a similar tonnage obtained about ten days ago, through an exchange of sheet bars. The Standard Sanitary Mfg. Co. probably will buy foundry grades before the end of the week. Foundry is not commanding above $14, valley. Inquiries involve no tonnages of size.

Ferro-Alloys.—Reports of German ferro-manganese selling at $49.50, seaboard, are heard, but other grades remain firm at $50. The market in this district is quiet, and lower grades of ferro-silicon continue irregular.

Plates and Shapes.—Manufacturers continue to quote plates and shapes at 1.40c and 1.45c, but attractive tonnages can be obtained at 1.35c. Sales have been scarcely heavy enough to fix prices at any level.

Sheets.—Although prices have been fairly well held the last fortnight, it is understood minimum prices are being shaded in many instances, and a further decline is not unexpected. Consumers show a disposition to cover first quarter needs, but manufacturers are declining to sell beyond Jan. 1 at present prices. Mills of the American Sheet & Tin Plate Co. are operating at about the rate prevailing last week.

Rails and Track Material.—Eastern railroads have not yet covered 1914 rail requirements, and are not expected to buy until after general conditions become more certain. Spike makers continue to quote 1.65c for standard sizes, although it is not improbable that figure could be shaded if a large tonnage were involved. Other track fastenings are unchanged.

Billets and Sheet Bars.—Practically all the leading makers are in a position to offer material, but are not attempting to push sales on account of prevailing low prices. Several middlemen are buying odds and ends, and selling them at low figures, but no large sales are reported. Prices remain unchanged.

Hoops and Bands.—Both hoops and bands continue firm and are in fairly good demand. They are listed at 1.60c and 1.40c, respectively.

Iron and Steel Bars.—Steel bar makers have been receiving a number of attractive orders, and the 1.40c quotation continues to be firmly held. Iron bars are not considered above 1.50c, although some makers are refusing to shade 1.55c. Cold rolled shafting is listed at 60 and 62 per cent off, although it is understood some tonnage has been obtained at 63 per cent off within the last fortnight.

Muck Bar.—Indications are that the United Sons of Vulcan will adopt a sliding scale, as a result of continued refusal on the part of leading manufacturers to accept the proposed flat rate of $7 a ton for puddling. Muck bar nominally is quoted at $30, Pittsburgh.

Bolts, Nuts and Rivets.—Structural and boiler rivets are not above 1.90c and 2c, respectively, and a large order probably could be placed at less than those figures. Nuts and bolts are in good demand but not many new orders are being placed.

Tubular Goods.—No change in steel pipe discounts has been announced although some in the trade believe new prices will come out next month. Discounts are not being firmly held. Boiler tube discounts continue irregular, although leading makers continue to quote prevailing prices.

Tin Plate.—No attempt has been made to buy material for next year's delivery, and nothing is heard regarding the price of tin plate for future shipment. Crop failures in the west have shortened the canning season in certain centers to a considerable extent. Leading makers in this district express the opinion that it would be unprofitable to import tin plate under present conditions, especially along the eastern seaboard.

Wire.—For the last 10 days some manufacturers have been selling material at $1 a ton under the prevailing market, and despite efforts of the leading mills to maintain nails on the basis of $1.65, the market today is quotable at a range from $1.60 to $1.65 for nails and from $1.40 to $1.45 for plain wire. In some respects, existing conditions are similar to those prevailing in 1911, although makers are sanguine that no further declines will be experienced.

Wire Rods.—The market is quiet. Both Bessemer and open-hearth wire rods are listed at $27, Pittsburgh.

Coke.—Practically no coke is being sold, and conditions probably will remain quiet until buying for November begins. Some shippers continue to regard $2.50, ovens, the price of standard furnace coke, but consumers do not expect to experience difficulty in covering needs at $2.25, and slightly under. Foundry grades are quiet and unchanged. The Connellsville *Courier*, for the week ending Oct. 4, says production was 358,298 tons, a decrease of 7,196 tons, compared with the week before.

Old Material.—Larger consumers are well supplied with material, and will not have to figure in the market again for several weeks, unless melts are substantially increased. Dealers complain about being unable to move stocks at any price, and shipments have been held up in a number of instances. Practically all grades declined from 25c to 50c a ton last week.

The Mesta Machine Co., of Pittsburgh, Pa., has decided to open a Canadian branch plant at Bridgeburg, Ont., to manufacture engines and rolling mill machinery. A section of the Mentholatum Co.'s new factory, being erected, has been leased and the company expects to start active operations as soon as the factory is ready for occupation.

The Excelsior Laundry Co., Dayton, O., advises it will require laundry machinery for the addition now being built.

Chicago Expects Revision of Prices

Some Quotations Already Lowered — Weakness Develops in Steel Bars—Lower Prices on Sheets

BY H. COLE ESTEP

Office of THE IRON TRADE REVIEW,
1521-23 Lytton Bldg.,
Chicago, Oct. 14.

The pressure for lower prices is becoming more severe as the mills approach the end of their rolling orders. New business shows practically no change in volume and the railroad buying which was confidently expected during October has failed to materialize. With the exception of hoops, bands, tubes and pig iron, prices on steel products have dropped from $1 to $2 per ton during the past 10 days. Mill operations are being curtailed at practically all of the plants in this territory. It is evident now that buyers are waiting for the price readjustment which appears to be inevitable.

Pig Iron.—The purchase of 4,000 tons of charcoal and malleable by a prominent Wisconsin foundry interest last week has so far failed to stimulate any great interest in 1914 requirements by consumers in this territory. During the past week, sales for future delivery have been confined to lots less than 500 tons. There is a fair sprinkling of orders for shipment during the remainder of this year. Southern iron is firm at $11.50, Birmingham, for shipment until July 1. Shipments of northern iron are understood to be in excess of the capacity of the furnaces now in blast and this commodity is increasingly firm.

Merchant Bars.—Steel bars, which have heretofore been impregnable, are showing signs of weakening and there is evidence that tonnage has been placed during the past week at 1.53c, Chicago, equivalent to 1.35c, Pittsburgh. It is impossible, however, at this writing to determine whether this business includes a sufficient tonnage to form a basis for quoting the market. Iron bars are weaker, sales having been made freely at 1.25c, Chicago, both by the local makers and by mills situated in Indiana. To some extent the low prices of iron are being equalized by substantial reductions in the price of scrap. Bands and hoops are fairly firm at 1.63c, Chicago. Orders of iron and steel out of stock are limited. Shafting is again showing irregularity, but the warehouse price is being firmly held.

Plates and Structurals.—Plate mills are operating at materially reduced capacity. Both sheared and universal plates are showing more weakness than any other of the heavy finished steel products. Sales are now being made at 1.53c, Chicago, equivalent to 1.35c, Pittsburgh. Structurals are also being shaded, although the exact amount of the concessions is indeterminate. The western car manufacturers are practically without new business.

Rails and Track Fastenings. — The purchase of 20,000 tons of standard rails by the Great Northern from the Illinois Steel Co. has been confirmed. There has been no additional rail buying reported in the west during the past week. The manufacturers are receiving a fair sprinkling of small orders, ranging from 1,000 tons to 4,000 tons for immediate shipment. These have been of material assistance recently in keeping the mills operating on a good schedule. The prices of track fastenings are under pressure and it is understood that concessions are being made on angle bars and bolts.

Bolts, Nuts and Rivets.—There has been some railroad buying of machine bolts during the past week, but this tonnage has not been sufficient to lend any strength to the quotations. Rivets are still irregular, although there are no reports of quotations lower than 1.95c, Chicago. Specifications for bolts and nuts are being received in fairly liberal quantities by the agricultural implement manufacturers.

Sheets.—While spelter was advancing, galvanized sheets were declining and now that spelter is drifting to lower levels every day, the sheet market has been accelerated downward. Sales of No. 28 galvanized are being made freely at 3.05c, Pittsburgh, and the 2.05c quotation on the base gage on black sheets is also being shaded. There is a fair amount of business for immediate rolling and the mills have been able to keep going at about 85 per cent of their capacity. Warehouse prices on galvanized sheets have been cut $4 a ton, with an additional concession of 10 cents per 100 pounds on orders for 25 or more bundles.

Wire Products.—There is no shading on wire quotations in the west and the volume of business coming in from agricultural centers is encouraging. October will make a much better sales record than any of the three months preceding. The demand for wire products from industrial sources, while fair, is not as brisk as could be expected.

Cast Iron Pipe.—Although orders for cast iron pipe show some falling off, compared with last week's record, makers are nevertheless confident that October will prove to be a fairly good month. The United States Cast Iron Pipe & Foundry Co. was awarded 600 tons of water pipe at Fairfield, Ill. A contractor at Elgin, Ill., purchased 215 tons, and the American Cast Iron Pipe Co., Birmingham, booked 400 tons at Kansas City, Mo.

Merchant Pipe and Tubes.—Business in merchant pipe and tubes is fairly satisfactory and the prevailing discounts are being well maintained. The tube market seems to be in a healthier shape than the pipe trade. Recent statistics show a serious falling off in building construction in Chicago in September, compared with the corresponding month in 1912. This has naturally had its effect on the outlet for iron and steel pipe.

Old Material.—The decline in scrap prices continues unabated and it is evident that before long prices lower than anything in the history of the business will be recorded. Twenty-five cents a ton or more has been shaded from the quotations on car wheels, arch bars, No. 2 railroad wrought, steel knuckles, No. 1 busheling and railroad malleable. The St. Louis & San Francisco railroad sold approximately 1,700 tons of various grades of scrap material Oct. 13. This included 150 tons of No. 3 railroad cast and 200 tons of miscellaneous car wreckage.

Pittsburgh Company Expanding

At a meeting of the board of directors of the Pittsburgh Iron & Steel Foundries Co., Midland, Pa., Weaver H. Rogers was elected vice president and general manager and has assumed the active management of the company.

In order to take care of the large increase in the demand for Adamite rolls and castings manufactured by this company, in addition to the new lines now under development, the company is now contracting for two new electric traveling cranes of large capacity, a new heating furnace and other equipment, which will give it a capacity equal to the largest foundries in the Pittsburgh district, the present floor space being approximately 125,000 square feet. When these installations are completed, it will require a large increase in the operating force to handle the increased production.

Rumors Check Buying at Cleveland

Where Announcement of Lower Prices is Expected— Further Concessions on Sheets—Slump in Old Materials

BY GEORGE SMART

Office of THE IRON TRADE REVIEW,
Penton Bldg.,
Cleveland, Oct. 14.

Iron Ore.—The week opened with conditions favorable to a good movement of ore, fair weather prevailing over the whole lake region. Shippers were compelled to charter some outside tonnage for prompt loading during the latter part of last week, owing to derangement of the lake fleet caused by continued thick weather, but contract vessels are now arriving in sufficient numbers to take care of the movement. Dispatch is letting up all around, however, and vessels are spending some time in port. Cargoes are getting smaller and the congestion at Buffalo is cutting quite heavily into tonnage. It is expected that from now on all vessels will be busy until navigation closes. During October last year the fleet moved 7,010,219 tons and the movement will undoubtedly approximate that during the present month, though it is not expected to exceed it.

Pig Iron. — The market continues stagnant with sales very light and prices unchanged. Consumption is undiminished in the foundries, but in some steel plants, it is sharply reduced.

Coke.—Greater weakness has developed in the furnace coke market and some sellers have offered to sell for spot delivery at $2, and on contracts at $2.10. There is, however, no activity in the market, as furnaces are not anxious to buy when prices are softening.

Finished Material. — Rumors that lower prices will soon be announced on leading steel products are persistent and have had the effect of further checking buying, which for weeks has been very limited. Buyers now seem to be confident that lower prices must come and are placing orders only for immediate needs. More weakness has developed in sheets and minimum quotations are 1.55c, Pittsburgh, on No. 10 blue annealed, 2c on No. 28 black and 3.05c on No. 28 galvanized. The structural market is very quiet with competition keen and very low prices being made on fabricating and erecting. Bar iron is dull and mills are having less difficulty in getting enough orders to keep the plants in operation.

Old Material.—Business was light and demand dull throughout the past week in the scrap market. Dealers are generally pessimistic over the outlook. The Lake Erie, Union and Empire rolling mills are practically out of the market for busheling. The Upson Nut Co. is accepting limited tonnages of heavy melting steel on old contracts. Other steel buyers are offering only about $10.25. The market for old iron rails has weakened about $2.50 a ton during the past month or so, with few sales of consequence; old steel rails have dropped about $1.50; old steel boiler plate, 50 cents; malleable railroad iron, 75 cents; steel axles, $1.50; axle turnings, $1; malleable agricultural iron, 50 cents; bundled sheet scrap, 50 cents; No. 1 railroad wrought, 50 cents; cast borings, 50 cents; stove plates, 25 cents; wrought iron piling plate, $1; wrought iron arch bars, $3.

Two inquiries for semi-finished material, one for 1,000 tons and one for 500 tons, are pending.

RUMORS OF SHADING

Of Prices of Southern Iron Have Not Been Confirmed.

BY W. B. NEAL

Office of THE IRON TRADE REVIEW,
Birmingham, Ala., Oct. 14.

Pig Iron.—Current rumor has it that the price of $11.75 per ton, Birmingham, for No. 2 foundry, basis, for first quarter delivery has been shaded on some desirable tonnages, but close inquiry has failed to confirm, and it is believed that $11.75 per ton for No. 2 foundry is being maintained for all entries for first half 1914 deliveries. Considerable inquiry was made for iron during the week. Two large orders were turned down by one of the large producing interests, because of inability to furnish the iron within time specified. However, several orders of good volume were booked. The sales for the week aggregated some 10,700 tons. One lot of 2,500 was booked for first quarter delivery, also 4,000 tons in lots of 100 tons and 500 tons for same delivery. One lot of 1,500 tons for quick delivery was entered at $11.50 per ton, No. 2 foundry, basis, Birmingham. Also 2,700 tons of special analysis, in lots of 100 tons and 500 tons, a part of which was for quick delivery and the remainder for the last quarter of 1913. This brand of iron always carries a premium over the No. 2 foundry according to its analysis. The entire make of the several furnaces is being forwarded and but little iron, comparatively, is now on the yards. Calls for iron under contract are very urgent and offers to accept grades different from specifications are frequent.

Cast Iron Pipe.—Some new orders for pipe have been entered during the week, but not of very large tonnage. One order for a special make of extra heavy water-pipe, sustaining a pressure of from 275 to 300 pounds, for some special requirement in the northwest, was entered. Activity and push characterize the operations of the several plants at this time.

Old Materials.—The scrap iron market is not as active as it was some weeks past, but it is not wholly dormant. Some tonnage is being moved on previous contracts and some new sales have been made during the week.

Plans for Naval Vessels

Washington, Oct. 14.—Designs and specifications for the supply ship and transport authorized by the naval appropriation act having been approved and the bids called for, the bureau of construction and repair has completed the plans for all vessels prescribed for the navy by that appropriation act. The total limit of cost of all vessels authorized by the act is $18,878,936. The transport is to cost, exclusive of armor and armament, not to exceed $1,850,000, and the supply ship is to cost, exclusive of armor and armament, not to exceed $1,425,000.

Secretary of the Navy Daniels last Thursday issued a circular inviting all ship builders with sufficient plant capacity, to submit competitive bids for the construction of the supply ship and transport. Certain navy yards have also been directed to prepare and submit estimates, the department hoping in this way to obtain the widest competition. The bids will be opened Dec. 20. The transport will be 460 feet long, 61 feet beam, and 20 feet draught, and will have a maintained sea speed of 14 knots and will be fitted to provide comfortable quarters for approximately 2,000 men.

S. F. Bowser & Co., Fort Wayne, Ind., advises that their new factory building is to be used as an additional boiler shop to care for increased business. All the equipment has been bought.

Southern Iron Very Dull at Cincinnati

With Some Tonnage Still Selling at $11, Birmingham—Coke Develops Weakness—Car Shortage in Wise County

BY S. G. BACKMAN

Office of THE IRON TRADE REVIEW,
503 Mercantile Library Bldg.,
Cincinnati, Oct. 14.

Pig Iron.—The pig iron market has shown but little change within the past two or three days from that of the last two weeks. Practically no buying and selling is being done, as there are no new inquiries being received by dealers and melters are showing no inclination to buy at the present time or to close on those inquiries already before the market. It is probable that there will not be much of a buying movement before the first of the year, as consumers see no prospect of the market advancing before then and consider that they can better judge its immediate future a little later on than at the present time.

Although practically every furnace in both Tennessee and Alabama is openly quoting $11.50, Birmingham basis, for No. 2 foundry iron for either the last quarter or the first half, it is known that one and probably more of these furnaces are quietly soliciting business at $11 and $11.25, Birmingham, for this year. We, therefore, continue to quote from $11 to $11.50, Birmingham basis, for No. 2 foundry iron for delivery from the present time through the first half. There is a decided scarcity of No. 2 soft throughout the south and this grade is probably much stronger than No. 2 foundry.

Southern Ohio prices are unchanged at $14, Ironton, for either this year or the first half of next year, on No. 2 foundry iron. Malleable and basic are also being held on about this same basis.

No new inquiries of importance have been received by dealers this week, but the following are unclosed from those of the week or so previous: Four thousand tons of foundry iron divided between northern and southern grades from Noblesville, Ind.; 1,000 tons of the same grade from Richmond, Ind.; 1,000 tons of malleable iron from Terre Haute, Ind.; 1,000 tons of foundry iron from Marion, Ind., and from 2,000 to 4,000 tons of foundry iron, northern and southern, from Evansville, Ind.

Coke.—The coke market is probably not as strong as it was a week or so ago, and prices in several of the fields, especially for prompt shipment coke, have been slightly reduced. The Connellsville district has apparently lost more strength than any of the others, due principally to the fact that production has been increased there recently until it now probably exceeds consumption by a slight margin. Furnace coke can be had as low as $2.15 per ton, ovens, and foundry coke at $2.85 per ton, ovens, all standard brands for either prompt or contract shipment. In the Wise county district, prices have maintained their strength chiefly because of the scarcity of labor and the shortage of railroad equipment, as it is practically impossible in several cases to make shipments as specified. In the Pocahontas district, more coal has been mined recently and more coke made than for some time, with the result that the ovens are anxious to move some as soon as possible and have reduced prices accordingly. Foundry coke can be had at $2.85, ovens, and furnace coke at from $2.20 to $2.35 per ton, ovens. New River district is probably as strong as any of the others, if not stronger. Not much coke is being produced there, the operators and prices have held at their former level.

Finished Material.—Specifications received by the local sheet mill during the week have been heavier than for several weeks past. New business is fairly good, most of the inquiries calling for quick delivery, which is only natural, as most of the buyers in this territory want quick shipments at this time of the year. The mill is about six weeks behind on deliveries, which has been the case for several months. Mill prices are unchanged at 2.20c on black sheets No. 28 gage and from 3.20c to 3.25c on galvanized sheets No. 28 gage, f. o. b. Newport (Ky.) and Cincinnati. Warehouse business at most of the local houses has been rather good during the past week. It appears as though this market is somewhat spotted, as most of the dealers reported conditions rather slow during the past two weeks. The market has apparently fallen into a peculiar condition, which is rather common here, namely that of being fairly active for one week and then dropping off during the two succeeding weeks.

Old Material.—The scrap iron market has shown no tendency during the past week to regain its former level, which was reduced about 50 cents a ton recently. It now appears that it will be a long time before the market can be advanced out of the rut it has been in for so many months, as conditions are rather unfavorable. There is a large surplus of scrap available, but very little demand. Dealers are not being offered even the regular market prices in many instances and are therefore not pushing sales. Prices are very uncertain, due to the long period of inactivity.

STRONG DEMAND

For Shipments of Pig Iron on Contracts in St. Louis Territory.

BY E. C. ERWIN

Office of THE IRON TRADE REVIEW,
St. Louis, Oct. 14.

Pig Iron.—The local market is devoid of inquiry, except for small lots, but the demand for shipments on contracts is strong. Local dealers are quoting southern No. 2 at $11.50 for delivery over the remainder of the year, and $12 for first quarter shipment. No quotations are being made beyond the first quarter. Northern iron is firm at $14.50 to $15, Chicago, and $14 f. o. b., Ironton.

Coke.—Considerable difficulty is experienced in getting enough cars to supply the demand for coke shipments on contracts, but no new business is being transacted. Connellsville 72-hour foundry coke is quoted at $3 to $3.35 for prompt shipment, and $3.25 to $3.50 on contracts. Virginia 72-hour foundry is offered at $3 for prompt delivery and $3 to $3.25 on contracts.

Old Material.—All scrap iron prices are down 50 cents a ton from last week's quotations, owing to the immense amount of scrap the railroads have thrown upon the market recently and the refusal of the mills to buy. It is strictly a dealers' market, and they only buy at the lowest figure obtainable. No lists are out this week.

Q. W. Wellington has bought the plant of the E. R. Allen Foundry Co., Centerville, N. Y. The company is in bankruptcy and the plant was sold by the referee to satisfy judgments. The concern has been engaged largely in producing castings for the Ingersoll-Rand Co., and it is believed that once matters are adjusted can operate at a profit.

The Seattle-Astoria Iron Works, which recently removed from Astoria to Seattle, has begun operations in its new location. The capacity has been trebled. The present site contains three acres and has railroad and water transportation connections. John Fox is president.

Buyers Still Hesitate in Eastern Mart

Definite Developments Lacking as to Foreign Competition — Pig Iron Stocks Reduced

BY C. J. STARK

Office of THE IRON TRADE REVIEW,
326 Real Estate Trust Bldg.,
Philadelphia, Oct. 14.

A general backwardness of buying is shown in all eastern iron and steel markets. How much of this can be attributed to the present uncertainty whether foreign steel products can undersell domestic material in the Atlantic seaboard zone under the reduced tariff duties, is still a question. There remains a lack of positive knowledge upon this point, as transactions are still lacking, but there is a growing appreciation that domestic mills in the main in finished products are likely to hold the eastern markets against foreign trade invasion, without disastrous consequences to themselves. In the cruder materials, the chances for importation seem strongest.

Pig Iron.—Buyers with their requirements well in hand for the remainder of the year hesitate under present conditions to order iron for more extended deliveries. There remains nevertheless sound evidence of good current consumption. Shipments were so liberal in September against the furnaces represented by the Eastern Pig Iron Association that stacks declined about 10 per cent in that period. Booked orders also fell away somewhat. Present merchant stocks in the east are reported as about 80,000 tons. Curtailment of output is apparently not yet over. The one active Crane furnace at Catasauqua is now going out. The Keystone furnace of the Reading Iron Co. may start in November, but the Emaus stack will probably go out. In Virginia, Covington has gone in. Foundry iron sales are usually of the carload and few hundred-ton class. Sales at $15.80 and $15.85, delivered this district, for No. 2, continue to be made and up to $16.25 is also being paid. Continued investigation confirms previous calculations that Middlesbrough No. 3 English iron with duty free, even with warrants down to 53s, is available not under $15.75 to $16, delivered along the Delaware river, and at this level is at least 75 cents above northern domestic iron. At farther inland points, the margin in favor of northern No. 2X is from $1 to $2. Virginia iron continues to be offered at $13 and $13.25, furnace, for No. 2X. Standard forge is quoted at $15 to $15.25, delivered eastern Pennsylvania, with few sales. Basic is $15.50 to $15.75, delivered, depending upon the destination, but no inquiry is pending. A Chester steel foundry, recently inquiring for 1,000 tons of low phosphorus, is understood to have closed. Another nearby steel foundry asks 500 to 600 tons of this grade. Small sales of standard low phosphorus were done this week at the range of $23 to $23.50, Philadelphia.

Iron and Steel Bars.—Only occasional sales of steel bars are being made and specifications are not so active. Mill prices, however, remain firm at 1.40c, Pittsburgh. Steel bars from Philadelphia warehouses are quoted at 1.90c, and it is indicated 1.85c might be done. The Jones & Laughlin Steel Co. is low bidder on 1,800 tons of twisted bars for the Panama canal. The Concrete Steel Co. is offering to substitute deformed bars and the matter is undecided. In some directions it is reported that the firm condition in steel bar prices is helping bar iron. Some mills will still sell common bars at 1.25c, mill, however. Others ask 1.35c, mill.

Plates. — Figures are being taken from eastern makers on 8,000 to 10,000 tons of steel, including 6,000 tons of plates for four additional vessels, which are up for construction bids before eastern yards. This increases the tonnage for prospective boat work now in the east to easily 30,000 to 40,000, but awards still lag. New bookings with eastern plate mills are of a miscellaneous character, are considerably below capacity and operations are declining. Universal plates are especially slow. The usual price remains 1.40c, Pittsburgh, but some sales at 1.35c, Pittsburgh, or 1.50c, Philadelphia, are reported, especially in the narrower widths. Plates from store are about 2.00c, Philadelphia.

Structural Material.—More frequent reports of 1.35c, Pittsburgh, or 1.50c, Philadelphia, on structural shapes are appearing. It is apparent that at least two eastern makers will now do this price in some cases and equally reliable statements have it that one of the larger makers in the Pittsburgh district is meeting this quotation in eastern territory. The market remains pretty narrow on new tonnage and eastern mill operations are at 60 to 70 per cent. Shapes from store are quoted at 2.00c, Philadelphia.

Sheets.—Some slowing down is taking place in the eastern sheet market. New buying is lighter and some customers are requesting the mills to hold back on shipments. Some curtailment of mill capacity is slated to take place in the east. Prices are unchanged on the basis of 1.65c, Pittsburgh, or 1.80c, Philadelphia, for No. 10 gage, blue annealed.

Semi-Finished Steel. — While it is known that some buyers are sounding out the situation on German and English billets to compare prices with those asked by domestic makers, nothing of a definite nature has yet resulted from these negotiations. One of these buyers, as reported, is figuring upon 5,000 tons. Eastern Pennsylvania makers continue to hold billet prices at $25, this district, and several sales, including one lot of 500 tons, are reported at this figure. None of these makers has yet been obliged to make a quotation against foreign competition.

Old Material.—According to general estimates, the government has at least 75,000 tons of scrap materials at the Panama canal, which it is now preparing to market, as previously reported. This tonnage may be greatly increased through the scrapping of unsalable machinery. In this market, old material buying is quiet and prices are weaker. A Schuylkill Valley steel maker took about 4,000 tons of heavy melting steel at $11, delivered, a new low price. A Coatesville mill, having bought 30,000 tons in recent weeks, is out of the market. Turnings and No. 1 forge declined further in the week. Cast is firm with a fair demand. First grade low phosphorus is bringing $15.50 to $16, delivered.

Corporation Receives Medal

In recognition of its exhibit illustrating its work of hygiene and safety in its various plants, which was made at the International Exposition of Hygiene, at Dresden, Germany, in 1911, the United States Steel Corporation has been made the recipient of a bronze medal by the exposition. This medal was received by Chairman E. H. Gary during the past week. After the government had declined to become actively interested in the affair, the American Museum of Safety, upon its own initiative, collected for the Dresden exposition, typical exhibits from 25 large corporations in this country and thereby demonstrated to Europe what the United States is doing along this line. At the close of the exposition, all the exhibits were taken to Berlin, where they will remain permanently in the Berlin Museum of Safety.

Extreme Dullness in Pig in New York

English Merchants Figuring on Freight Rates to United States—American Product Still Has Advantage

BY C. J. STARK

Office of THE IRON TRADE REVIEW,
503-4 West St. Bldg.,
New York, Oct. 14.

Pig Iron. — Reports have reached New York that some English merchants are seeking freight terms between Middlesbrough and principal Atlantic ports in this country. One of these merchants in the past has acted as agent for eastern cast iron pipe makers when the latter imported English iron and recently this particular firm bought 50,000 tons of warrants, as reported. It is not believed on this side, however, that the present negotiations are any more than an effort to size up the relation of the two markets, preparatory to any action that may subsequently develop. As previously stated, Middlesbrough iron at 53s cannot be laid down at New York docks much under $15.30, which leaves it at least $1 a ton above domestic irons, delivered at consumers' plants. One large consumer who buys in this district has approached agents on the opportunity of importing English iron, but has been advised that this would be unprofitable at present. Extreme dullness rules in the local market. Richardson & Boynton, Dover, N. J., who have been asking 1,000 tons of No. 2 plain for first quarter, are expected to buy 4,000 to 5,000 tons, but will not close for several days. A New Britain, Conn., shop still has open 1,000 tons of No. 2X for first quarter. The Lackawanna railroad has purchased 400 tons of foundry irons for Scranton, from a Buffalo furnace. A Trenton manufacturer of plumbing apparatus asks 600 tons of prompt No. 2 plain. Prices are fairly steady at $15.75 to $16.25, tidewater, for No. 2X, with Buffalo at $14, furnace, setting the inside figure. An inquiry for 2,000 to 3,000 tons of southern iron for Italy has appeared. Sellers figuring on a lot of 2,000 tons of foundry for Australia have had great difficulty to obtain freight iron.

Ferro-Alloys.—Some large consumers of ferro-manganese express the opinion that lower prices will be required to stimulate buying. At this time, there is very little activity at the level of $50, seaboard, and considerable inquiry which has been out has now become inactive. So little is being done that the true strength of prices is not shown.

Plates.—Despite some reports to the contrary, the Florida & East Coast railroad still is figuring on two steel car floats of unusual size, which will require 6,000 to 8,000 tons of steel, largely plates. One car company is reported in the market for a tonnage of steel to cover some recent orders, but generally the car market is furnishing little new steel requirements. Only about 2,000 new cars were ordered in September. Plate business generally is of a small lot, miscellaneous character. Considerable of this business is going at 1.40c, Pittsburgh, or 1.56c, New York, but the indications are that some producers would accept at least $1 less on a tonnage.

Structural Material.—There is more evidence of plain material prices below 1.40c, Pittsburgh, or 1.56c, New York. Two or three different makers both in the east and middle west, are understood to have been accepting 1.35c, Pittsburgh, or 1.51c, New York, in some cases. Some eastern makers are holding to 1.40c. New York City continues unusually quiet on new work, but in other eastern districts the tonnage is better.

Cast Iron Pipe.—Specifications for 60,000 tons of 10-foot segments for a sewer line in Buenos Aires, Argentine, upon which bids now are being asked, have been received by some American cast iron pipe makers. This large tonnage is in addition to the 100,000 tons or more of cast pipe placed by Buenos Aires several months ago with German makers, as previously reported. A better inquiry is reported in the eastern pipe market. Atlantic City is taking bids this week on 6,500 tons of 30 and 48-inch, largely the latter. Toronto closes Oct. 21 on 4,800 tons of 36-inch, and Quebec is inquiring for about 1,400 tons of 4 to 10-inch pipe. Bids go in tomorrow on 1,270 tons of 8 to 12-inch for Manhattan. The Standard Cast Iron Pipe & Foundry Co. has taken 1,750 tons of 4 to 24-inch for a buyer at Bridgeport, Conn., at $21.80, delivered. The Fall River, Mass., inquiry of 500 tons, has gone to Warren Foundry & Machine Co. Prices show much irregularity. Quotations of $20 and even below at the foundry are not uncommon, where makers want particular orders.

Iron and Steel Bars.—Despite the slower new business, deliveries in steel bars still are quite extended. One large maker, who is in the most favorable position to make shipments, is now delivering in about four weeks. Other mills are still unable to ship some sizes in less than eight to ten weeks. Buyers show a disposition to hold off. The requirement of 5,000 tons of bars for the Massachusetts Institute of Technology, Boston, is being held back. The iron bar market shows little change, and prices range from 1.25c to 1.35c, mill.

Old Material.—The scrap market is quieter. Some of the larger consumers of steel scrap in eastern Pennsylvania who have been buying spasmodically during recent weeks, are now out of the market. Heavy steel has declined and sales of $11, eastern Pennsylvania, are noted. Sales in all grades usually are small, with cast scrap leading in activity.

BUFFALO BUYERS

Are Placing No Orders for Pig Iron, But Prices Do Not Soften.

BY FRANK R. DOLBEE

Office of THE IRON TRADE REVIEW,
Buffalo, Oct. 14.

Pig Iron.—Foundries in this territory seem to be marking time, utilizing what iron they have on hand for immediate needs, and neither making inquiries nor placing any tonnages for their future requirements, pending a better understanding of what may be the outcome of the recently enacted Underwood tariff and the proposed currency legislation. This holding off has caused a lull in the market. The furnaces of the district report that practically no new business developed in the past week. The attitude of Wall street on the currency measures of the administration is being watched with interest.

So far the dull period has not softened prices. These are as firm as they have been for several weeks. The producers do not feel that the lull will last, but believe that the condition of uncertainty among consumers will disappear with a better understanding of the tariff and currency situation, followed by a period of buying to meet the demands of the ultimate consumer.

Finished Material.—Buying in small lots characterized the trading of the week among the mills and agencies of the district. No large placements were made and practically none are under negotiation. In bars nothing lower than 1.40c, base, is being quoted, although offers to mills and agencies at a lower figure have been

made and turned down. While the price is not considered particularly strong, no cutting has materialized during the week, even though purchasers are holding off when these figures are given to them. Some placement for delivery up to April 1 has been made at 1.40c, base. Structural, for favorable tonnages, it is said, has softened to 1.40c, base, although small lots have been booked at 1.45c and 1.50c. The sheet market is sporadic and the movement in tin plate is slight, with the exception of the placement of a considerable tonnage in Canada at a figure reduced to meet the competition from Wales producers.

Old Material.—Not enough trading took place during the week to change prices. The scrap market is practically at a standstill. The only activity noted is in borings and turnings and a moderate volume of cast scrap. Some heavy melting steel is being sold out of this district to users in the valley. None of the latter commodity has been taken by the leading local consumer in some time.

BRITISH IRON TRADE

English Makers Prepare to Export Pig Iron.

London, Oct. 14. (By cable.)—Cleveland warrants 52s 1½d, an increase of 4½d since yesterday.

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., Oct. 4.

Some optimistic pig iron traders are looking forward to business resulting from the United States tariff law placing pig iron on the "free list." Shippers are fixing up big cargoes already sold, apparently, in readiness to do some American business. Middlesbrough is taking great interest in the American "free list" in expectation of putting through some exports; but there is a disposition to restrain optimism in view of considerable handicaps that must be imposed by the rather heavy ocean freight rates. The impression prevails that, but for the extensive reduction of output, this week would have seen another drop in prices. Yesterday's quotations for warrants were 54s 3d ($13.18) with 54s 6d ($13.24) one month, and 54 s 11d ($13.34) three months. September shipments of iron reached 96,000 tons, while warrant stock was reduced 11,000 tons, the amount in store now being 170,000 tons. In the Birmingham district several furnaces have blown out and only five stacks are operating in the Barrow district.

This has been a week of considerable readjustment of finished iron and steel prices, probably in anticipation of the coming quarterly meeting. A meeting took place in London on Monday fully representing the Scotch and English steel makers, when it was decided to reduce the minimum selling quotations by 10s per ton. This will apply to most descriptions of steel with the important exception of joists. Boiler plates will now become £8 2s 6d ($39.48), ship plates £7 7s 6d ($35.84), angles at £7 ($34.02) and bars £8 ($38.88), all less 5 per cent for Clyde delivery or equal. The reduction, following so closely upon the one recently made, shows the great keenness of competition. In fact, ⅝-inch sizes are at the present time on sale in Birmingham for £5 8s ($26.24). The drastic nature of the "cut" rather surprised some people, but, in view of the depressing reports both from America and the continent, there is not much disposition to criticize it. The raw steel department has scarcely been affected by these changes, British makers finding themselves very fairly able to face foreign competition in this department.

The galvanized sheet trade shows some weakness in price, with quotations at about £10 7s 6d ($52.85). This fall has taken place in spite of the fact that there is quite a good demand for sheets, especially on foreign account and the mills are really well employed. The trade is suffering from the excessive output, due to the large additions to the number of mills in recent years. The Welsh makers are keen after business and, apparently, make price quite a secondary consideration.

Set Price on Stock

With its stock selling on the market at 170, the Youngstown Sheet & Tube Co., Youngstown, O., has placed a price ranging from par to 140 on the shares set aside at the annual meeting for sale to employes. The plan is to sell at the lower price to employes who have been with the company many years and have aided in earning the surplus, while those employed a shorter period have not the same claim, but will have the privilege of buying below the market value. Recent employes will be charged 140, which is 30 points under the market.

The Quinn Wire & Iron Works, Boone, Ia., has sustained a loss of $25,000 by fire.

METAL MARKETS

New York

Oct. 14.

Copper.—The copper market is weak and there is practically no demand from consumers. Producers and leading selling agencies still announce the 16.87½c, 30 days delivered, price on electrolytic, but one producer is offering small lots of the metal at 16.50c, 30 days. In the outside market, small lots of electrolytic may be had at 16.25c, cash. The producer's price on casting is still 16.85c, 30 days, but this metal may be had from second sellers at 16c cash. The best brand of lake is held at 17.50c, cash, and slightly inferior brands at 17c to 17.25c. These prices are still largely nominal. It is expected that the producers will be in the market shortly with lake for November delivery. Lake may be had in the outside market at 16.50c, cash.

Today's close for standard copper on the London exchange was £70 10s for spot and three months, compared with £73 7s 6d for spot and £73 5s for three months a week ago. In New York, 15c was bid and 16c asked for all positions today. Exports of copper so far this month are 12,321 tons.

Tin.—Consumption of tin continues good but demand is light and unsustained. Today's price was about 40.35c for spot. Today's close on the London exchange was £184 for spot and £184 10s for three months, compared with £184 15s for spot and £185 for three months a week ago. Arrivals so far this month total 1,870 tons, while 2,045 tons are afloat.

Lead.—Lead is selling in the outside market at 4.45c, New York, for carload lots. There are bids at 4.45c but no sales at this figure are reported. The leading interest continues to maintain its price at 4.50c.

Spelter.—Prime western spelter is offered here at 5.40c to 5.50c, but bidders appear unwilling to give more than 5.30c or 5.35c. Demand is weak and there is a weak tone in the market.

Antimony.—This market is dull. Prices, New York, duty paid, are: Cookson's, 7.50c to 7.62½c; Hallett's, 7.12½c to 7.25c; other brands, 6.75c to 6.87½c.

Chicago

Oct. 13.

Old Metals.—The copper market is in an unsatisfactory state owing to the fact that prices have been forced up to levels not justified by the demand from consumers. Spelter declined $6 a ton in the past week, current quotations being 5.35c Chicago. Lead is also notably weaker. Tin is about stationary.

We quote dealers' prices f. o. b. Chicago, as follows:

Lake copper, carload lots, 16½; casting, 16⅜c; smaller lots, ¼c to ¾c higher. Spelter, car lots, 5.35c; lead, desilverized, 4.45c; sheet zinc, $7.75, f. o. b. La Salle, in car lots of 600-pound casks; pig tin, 41c; Cookson's antimony, 8½c; other grades, 7½c.

Old Metals.—General decreases in the prices of spelter, lead and tin have been reflected in the old metal market. The volume of business is practically unchanged. Dealers report a light demand from consumers but believe that October's business will be fully equal to September.

We quote dealers' selling prices f. o. b. Chicago, as follows:

Copper wire, crucible shapes, 14½c; copper bottoms, 12¼c; heavy red brass, 13¼c; heavy yellow brass, 8½c; No. 1 red brass borings, 11½c; No. 1 yellow brass borings, 8c; brass clippings, 10c; lead pipe, 4¼c; zinc scrap, 4⅜c; tea lead, 4c; No. 1 aluminum, 16½c; No. 1 pewter, 28c; block tin pipe, 36½c; tin foil, 32c; linotype dross, 3¼c; electrotype dross, 3¼c; stereotype plates, 4⅝c; stereotype dross, 3¼c.

R. George James, formerly superintendent of the Louisville plants of the United States Cast Iron Pipe & Foundry Co., has been made president of the Universal Swing Joint Mfg. Co., to succeed B. J. Jansing, deceased.

LARGE FREIGHTER

Will be Built This Winter For a Canadian Company.

The Collingwood Ship Building Co., Collingwood, Ont., has just received an order from the St. Lawrence & Chicago Steam Navigation Co., of Toronto, for a bulk freighter to be 549 feet over all, 529 feet keel, 58 feet beam and 31 feet deep, to be delivered next spring. This is the second bulk freighter to be ordered by Canadians for 1914 delivery. The other vessel is building at the yard of the Western Ship Building & Dry Dock Co., at Port Arthur, Ont., and will be the largest bulk freighter on the lakes, being 625 feet long, or 8 feet longer than the Col. J. M. Schoonmaker.

The Great Lakes Engineering Works, Detroit, has also closed a contract with the Chicago, Duluth & Georgian Bay Transit Co., for a passenger steamer to be used in the excursion trade exclusively and to be a duplicate of the North American which came out last spring. This company also has on its books an order for a freighter for the stone trade of the great lakes and a steamer of Canadian canal size for the coast.

This completes the list of orders for new construction for next season's delivery and it is not likely that the shipyards of the lakes will be busy on new work during the winter. However, they will have considerable remodeling to do, as a number of owners have decided to better adapt the older type of vessels to the unloading machines by removal of 'tween deck stringers and stanchions and by the substitution of arch girders between hatches, which will be spaced 12 feet centers. The Toledo Ship Building Co., Toledo, O., has already been given the contract for so remodeling the steamers H. W. Smith and M. C. Smith, of the Great Lakes Steamship Co.'s fleet. With a great deal of this class of work going on and the usual repairs, the ship yards of the lakes will put in a busy winter.

Protests Against Scrap Rate

Washington, Oct. 14. — Attorney Frank Lyon in his argument before the Interstate Commerce Commission last week protesting against the proposed advance in scrap iron rates from Duluth, St. Paul and Minneapolis, Minn., to Chicago, and other points, said it was an entirely unjustified move by the railroads. After characterizing it as a forerunner to an attempt to increase the rates on all commodities between the points affected, Attorney Lyon declared the supply of scrap in Duluth, St. Paul and Minneapolis would be curtailed at least 25 per cent, the approximate amount of the proposed increase, because the farmer, who would suffer a loss in price equal to the advance, would not gather up his scrap, as it would not be worth his while.

HENRY B. LUPTON DEAD

Member of Oliver Iron & Steel Co., Passes Away.

Henry Buck Lupton, vice president of the Oliver Iron & Steel Co., Pittsburgh, and one of the best known men in the iron and steel trade, died Tuesday at his home in that city, as noted briefly by The Iron Trade Review last week.

He was born in Cincinnati, Dec. 23,

HENRY B. LUPTON

1849, and after completing a course in the public schools, entered the employ of W. A. McCall, a hardware merchant, of Cincinnati, with whom he was associated until the dissolution of the firm. He then became a manufacturer's agent, representing among others the Oliver Wire Co., and in 1896, Mr. Lupton went to Pittsburgh to become secretary of that concern. Two years later, when the American Steel & Wire Co. took over the Oliver company, Mr. Lupton accepted a position in the sales department in the New York office, where he remained until August, 1900, when he returned to Pittsburgh to become secretary of the Oliver Iron & Steel Co.

Mr. Lupton was a member of the Duquesne club. He left a widow, a daughter and a son, Dilworth R. Lupton, who is in the sales department of the Oliver company.

OBITUARIES

James G. Carson, one of the founders of the Fairmount Steel Works, Philadelphia, is dead, aged 79 years.

Michael Seeboth, secretary of the W. H. Pipkorn Co., 712 Park street, Milwaukee, wholesaler and jobber of foundry supplies and building material, died Oct. 6 at Milwaukee, aged 29 years. Mr. Seeboth joined the Pipkorn company 11 years ago. He had been ill for several months.

Maxwell Evarts, vice president of the Windsor Machine Co., Windsor, Vt., general counsel for the Southern Pacific and affiliated interests, died at his home in Windsor, Vt., aged 51 years. He was a son of the late William M. Evarts, who was secretary of state in the cabinet of Rutherford B. Hayes.

Capt. George E. Lovett died at his home in Boston on Oct. 1. He was an officer of the Smith & Lovett Co., iron worker, until six years ago when he retired. Capt. Lovett was a member of the Republican state committee and a member of the house of representatives of Massachusetts, as well as a member of the Boston common council. He was born in 1847.

H. W. Allison, for more than 38 years secretary, treasurer and general manager of the Allentown Rolling Mills and twice mayor of the city of Allentown, Pa., died at his home in that city on Oct. 12 after an illness of three months. For many years, Mr. Allison had his principal office of the Allentown Rolling Mills, which is one of the Pardee enterprises, in Philadelphia. At the time of his death he was 67 years old.

Milliken Sale Postponed.—The public sale by the referee in bankruptcy of the steel works and bridge shop of Milliken Brothers, Inc., which was scheduled to take place at the plant on Staten Island, Oct. 10, has been postponed to Nov. 11. This action was taken because the reorganization committee, which is working upon a plan to refinance the company, has not yet completed its work.

The Diamond Match Co., Oswego, N. Y., advises the addition it is erecting will be devoted to manufacturing matches. The machinery is built by the company and none will be bought outside.

Mills of the United States Steel Corporation at Gary, Ind., recently broke the American record for a day's output of steel billets when 2,540 tons of billets was rolled in one day.

LOWER BIDS

Submitted by Steel Companies—Government Will Save Money.

Washington, Oct. 14.—Following a conference, Secretary of the Navy Daniels held last week with representatives of the Carnegie Steel Co., the Midvale Steel Co., and the Bethlehem Steel Co., in which he granted them until this morning at 10 o'clock to submit new bids on material for battleship No. 39, it was announced late this afternoon that bids at reduced figures had been submitted on all three classes of material involved, and the awards went to the Midvale Steel Co.

On the original bids, all submitted figures were identical. On the new bids on Class A armor, on which the previous bid was $454 per ton, the Midvale this time put in a figure of $440, the Bethlehem, $444, and the Carnegie $447. On turret armor, Midvale bid $504 as against its original bid of $518, Bethlehem $508, and Carnegie $511. Class B, previously placed at $496, was offered by the Midvale at $482, by Bethlehem for $486, and by Carnegie for $489.

The secretary issued a statement in connection with the award to the Midvale company in part as follows:

"As a result of the action taken by the secretary in throwing out all of the bids for armor plate and asking that the manufacturers submit new bids which were really competitive and at a substantially lower price, $111,875 will be saved on the cost of armor plate for battleship No. 39, the contract going to the Midvale Steel Co., which was the lowest bidder.

"By securing really competitive bidding for the steel needed for No. 39, the department has already saved $378,261 on structural steel, $19,000 on medium steel plates, $3,000 on angle iron and $102,000 on the casings for the big turbines, making a total of $502,261. The added saving on armor plate brings the total saved on No. 39 up to $614,136, which does not include many small savings made in other items of equipment. While the secretary does not consider the prices finally accepted anywhere near as low as they ought to be, the necessity of beginning at once the manufacture of armor for battleship No. 39 in order to avoid serious delay in her completion and the improbability that any further reductions could be obtained at this time, decided him to accept the new figures."

Secretary Daniels made it clear this afternoon that he was not satisfied, even with the saving obtained, but would continue to urge the erection of a government plant as the only real and permanent solution of the problem.

In announcing the final awards, he said:

"I am, of course, pleased at the substantial saving in the cost of battleship No. 39, which has resulted from the refusal to accept the original identical bids of the steel companies, but I consider that the fight has only just begun, and that this reduction is the mere preliminary skirmish, as it is my intention to eventually secure armor for the United States navy at the actual cost of manufacture. This, it is my firm belief, can be achieved by the erection of a government armor plant, and it is my intention to lost no opportunity to urge upon congress the advantages of its construction."

CAR SHORTAGE

Is Complained of by Coal Shippers—Production Curtailed.

Pittsburgh, Oct. 14.—Further complaint about the shortage of cars is heard from shippers of bituminous coal, and many of the larger operators curtailed production last week, apparently not anxious to accumulate surplus tonnage. The lake trade and the usual line trade have kept the market well cleaned up in this and adjacent territories, and consumers in need of spot coal willingly have paid advanced prices which went into effect Oct. 1. Every effort is being made to ship as much fuel as possible up the lakes, but unless the car situation becomes easier, 1913 lake shipments will fall below those of 1912.

Quotations for spot shipment per ton at the mine in the Pittsburgh district are as follows: Slack, $1.10; nut, $1.40; mine run, $1.40; ¾-inch, $1.50; 1¼-inch domestic, $1.65.

Will Enter General Market

J. D. Waddell, general manager of sales of the Brier Hill Steel Co., Youngstown, O., has announced the appointment as assistant general manager of sales of P. H. Hubbard, who will have charge of sales upon all sheet mill products, including the company's black and galvanized sheets, formed roofing products, roofing specialties, etc. Mr. Waddell will devote his time to the sale of all the products to be manufactured by the company's new open-hearth plant and steel works. These products include sheet and tin bars, billets and slabs, upon which December and later deliveries are now being quoted.

TARIFF TALK

At A. F. A. Convention—Moldenke Says Cut Out Waste.

Chicago, Oct. 14.—The new tariff was given prominent mention in the official reports read at the opening session of the American Foundrymen's Association convention at the Hotel La Salle Tuesday morning. H. D. Miles, president of the association, stated that the foundry and metal industry faces the changes which will result from the new fiscal policy of the government with courage and hope that the eventual effect may be beneficial. He stated, however, that at this time it would be impossible for any one to forecast the industrial effects of the new tariff bill.

Dr. Richard Moldenke, in his thirteenth annual report as secretary of the A. F. A., was more outspoken. He stated that the American foundrymen would find it necessary to reduce their costs and increase the efficiency of their operations to the utmost in order to successfully compete with the great technical skill of the European metallurgists. He said it would be particularly necessary for the American manufacturer to cut out the waste in his processes, and it is his opinion that this country does not realize how extremely wasteful it has been in many of its industrial operations, not excepting the metal trades. The manufacture of coke in bee-hive ovens may be pointed out as one of the examples of the waste which must be eliminated, although under certain conditions today bee-hive coke is the only kind that can be manufactured profitably.

The reports of the officers also mentioned the flourishing condition of the American Foundrymen's Association, which now has 756 members and a larger income than ever before in its history. The proceedings Tuesday morning were opened by the usual addresses of welcome and response.

Col. Bope Recovers.—Col. H. P. Bope, vice president and general manager of sales of the Carnegie Steel Co., who was stricken with appendicitis and operated upon Sept. 16, at New York, has again resumed his duties.

The Portsmouth Steel Co., which occupies two floors in the First National Bank building at Portsmouth, O., for offices, has leased a portion of another floor for filing rooms.

GREAT DEPOSITS

In the Adirondacks and Nova Scotia—Mr. Eckel's Testimony.

Hearings in the Steel Corporation dissolution suit were not held on Monday, owing to the observance of Columbus day. On Tuesday, Edwin C. Eckel again resumed the stand. He first described the character and extent of the various ore deposits in the Adirondacks in New York state. In the Benson mine, he said, the tonnage of concentrates amounts to almost exactly 10,000,000 for each 100 feet in depth; working to a depth of 1,000 feet, about 100,000,000 tons of concentrates may be secured. Other properties in the Adirondacks also contain large tonnages. In the Adirondacks, said Mr. Eckel, there are large quantities of titaniferous ores which have not been used on a large scale up to the present time. Experiments which have been conducted by Mr. Rossi over a number of years, however, show that this ore is admirable for producing steel-making iron.

Mr. Eckel described the results of investigations which he has made at Conception Bay, in Newfoundland. The ore there is of sedimentary origin and most of it is below the bottom of the bay, the workings at present having extended 7,374 feet from the high water mark, measured horizontally, and 1,071 feet below the bottom of the bay, measured vertically. The fact that the ore is located under water, said Mr. Eckel, does not involve any added difficulty in mining. The ore, he said, averages 51½ to 51¾ per cent in iron content. Within 5 miles of Bell island, there are about 3,500,000,000 tons, of which at least 50 per cent is economically available. The ore may be placed on board ship at Bell Island for 80 cents per ton, or a little more. The cost of laying it down in Philadelphia is not higher than $2.25 per ton, while in ordinary shipping seasons, the cost is not higher than $2.10, or 4 cents a unit.

"The Nova Scotia Steel Co.," said Mr. Eckel, "sells it for 7c to 7½c per unit and this certainly allows a fair working profit."

The witness said that Conception Bay is the cheapest source of ore supply for our eastern seaboard.

In cross examination, Judge Jacob M. Dickinson wanted to know on what grounds the witness was able to state that it is cheaper to deliver Newfoundland ore to Philadelphia than it would be to lay down Lake Superior ore. The witness admitted that he had made no personal study of the Lake Superior district, but he was sure his statement was correct. He was then asked whether he was in the employ of the United States Steel Corporation.

"Since 1911, I have spent about one tenth of my time on work in the interest of the United States Steel Corporation, consulting with its attorneys, etc. Of course, now that this income law is under way, I wouldn't want to state just under what conditions I am working for the Corporation."

Mr. Eckel was questioned by the government attorney in reference to a review of iron ore developments which the witness wrote a number of years ago, in which he stated that the Steel Corporation, by reason of its large holdings of ores in the Lake Superior district, had a practical monopoly of the high grade, commercially available ores in this country. This, the witness explained, simply represented his opinion at the time, and these remarks were not based upon any personal investigation.

PANAMA MACHINERY

Now Being Offered For Sale by Government—Enormous Quantity.

Millions of dollars worth of machinery and equipment of a very miscellaneous character which has been used during the construction of the Panama canal is now being offered for sale in the open market by the government.

The machinery embraces both that purchased by the United States during the progress of the work and that previously left on the ground by the French engineers and utilized in the construction now practically completed. A very voluminous catalog of the machinery on hand has been issued by the government, and bids upon the various items are being requested from prospective buyers. These bids are being taken either for delivery at a United States or foreign port or delivered on dock at Colon or Port Ancon, Panama. The bids are being taken by both the Panama Canal Commission and the Chief Quartermaster, Culebra, Canal Zone.

Among the equipment are machine tools, cranes, engines, locomotives, freight cars and rolling stock of various descriptions, dredges, tugs, steamships and all manner of craft and mechanical appliances.

The Warman Steel Co., Redondo Beach, Calif., is installing an electric furnace. The Stassano Electric Co., Vienna, Austria, has the installation contract.

FARRELL TELLS

About the Steamships Carrying Corporation Products on Ocean.

New York, Oct. 14.—President James A. Farrell, of the United States Steel Corporation, during an all-day examination in the government suit against the Brazilian Steamship Conference lines, at New York, Friday, gave some official information regarding the recent organization of the United States & Brazilian Steamship Lines by the Steel Corporation to improve its carrying service in iron and steel products between this country and Brazil. At the present time, the Steel Corporation, through the United States Steel Products Co., its export subsidiary, is executing contracts for large tonnages of rails and other steel products with railroads and other consumers in Brazil and the new line is now operating in this trade.

The Steel Corporation now owns four steamships engaged in the ocean export trade and has under construction the San Francisco, of 9,000 tons burden. The four ships are now operating in the Argentine and west coast of South American trade, principally. There has recently been chartered four additional boats from the American-Hawaiian Steamship Co., and one from the Luckenbach interests. Other boats are to be chartered as needed.

It is the plan to use some of these boats as required in the new Brazilian line. Some of the boats now owned by the Steel Corporation are to be put under American register to gain the benefits to domestic registry vessels from the Panama canal. In his testimony Mr. Farrell discussed at length the ocean freight situation and suggested that American merchants would find it to their profit to act together in chartering.

Veteran Employes Meet.—The Westinghouse Air Brake Veteran Employes' Association will hold its annual banquet Oct. 23, in the Welfare building auditorium, at Wilmerding, Pa. Employes having served 21 years with the company are eligible, and there are now 327 members in the organization. A memorial service will precede the annual banquet.

The Fort Smith Excelsior Co., Fort Smith, Ark., advises its new plant is in operation and is equipped with the Kline horizontal excelsior machines.

The Wysong & Miles Co. and the Standard Boiler & Machine Works, Greensboro, N. C., have consolidated.

STRUCTURAL MARKET

Is Very Quiet in East—No Great Activity in Other Districts.

New York City remains a very dull spot in the eastern structural market. There is more activity outside of the metropolis, however, a considerable part of which is in railroad work. Awards the past week have been a little heavier. Statistics of building construction in Greater New York reflect the sharp falling off of new work. In the year to Oct. 1 the value of new operations totals $94,838,852, compared with $148,468,152 in the same period of 1912, a loss of 36 per cent.

No particularly large contracts have been received this week by fabricators in the Pittsburgh district. The Fort Pitt Bridge Works is low bidder on about 1,500 tons for a highway bridge in Washington county, Pa. The American Bridge Co. has taken 400 tons for a Michigan Central bridge, and the Jones & Laughlin Steel Co. has taken several small contracts, involving about 630 tons.

Competition for structural work is increasing in the west and the fabricators are giving their customers the full benefit of the lower prices available on shapes and plates. Only 870 tons are involved in fabricating contracts reported let in the west last week. No large jobs are pending in the Chicago district.

In the Cleveland district a number of projects are pending. The Cleveland City Forge & Iron Co., Lakeside avenue, is preparing foundations for considerable additional building. The Cleveland Electric Illuminating Co. is planning to build a three-story addition on its boiler house near Gordon Park. The H. Black Co., 1912 Superior avenue, Cleveland, maker of suits and skirts, has plans out for a two-story structure, 175 x 250 feet, for which Bethlehem sections are specified.

United States engineers are holding up plans for a county bridge to cross the Muskingum river at Dresden, O., due to desire to prevent narrowing of river channels following upon lessons the floods taught last spring.

STRUCTURAL AWARDS.

French Bank building, San Francisco, Cal., 225 tons to Ralston Iron Works.

Physicians' building, San Francisco, Cal., 500 tons to Ralston Iron Works.

Dock for handling limestone to be built by Michigan Alkali Co. at Alpena, Mich., 1,000 tons, awarded to Wisconsin Bridge Co.

State pier at Providence, R. I., 1,400 tons, awarded to McClintic-Marshall Construction Co.

Factory building, A. J. Logan Co., Pittsburgh, 350 tons, Jones & Laughlin Steel Co.

Genesee high school, Syracuse, N. Y., 200 tons, Jones & Laughlin Steel Co.

Superstructure for pier shed, Canton Co., Baltimore, 400 tons, the McClintic-Marshall Construction Co.

Strauss Warehouse, Baltimore, 400 tons; awarded to Detrick Bros.

Rockridge Construction Co. loft, West Twenty-ninth street, New York City, 400 tons, awarded to Ravitch Bros.

CONTRACTS PENDING.

St. Charles Hotel, Atlantic City, plans revised and steel requirements cut down to about 1,200 tons. Being refigured.

Empire Life Insurance Co. building, Augusta, Ga., 17 stories; estimated to require about 1,000 tons. Bids being taken.

Highway bridge, Washington county, Pa., 1,500 tons. The Fort Pitt Bridge Works is low bidder; expected to receive contract.

Apartment for Woolsey Realty Co., Eighty-fifth street, New York City, 500 tons, awarded to Ravitch Bros.

Hospital in Harlem, New York City, 400 tons, awarded to Ravitch Bros.

Apartment for Fullerton-Weaver Construction Co., Park avenue, New York City, 500 tons, awarded to Radley Steel Construction Co.

Building for New York Telephone Co., Albany, N. Y., 2,100 tons. Bids being taken.

Yale club, Forty-fourth and Vanderbilt streets, New York City, estimated to require 2,000 tons. Bids now being taken on the steel.

Public Schools Nos. 170 and 179, Brooklyn, N. Y., 700 tons. Bids being taken.

Springfield, Mass., high school, 1,200 tons. Caspar Ranger reported to be low on general contract.

RAILROAD BRIDGE WORK

Makes a Large Tonnage—Car Buying in West Expected Soon.

Larger tonnage of railroad bridge and structural work is offered or is under bid in the eastern market and aggregates 15,000 to 20,000 tons. This includes 4,000 tons for the Baltimore & Ohio, 4,000 tons for the Norfolk & Western, 6,500 tons for the Lackawanna, 1,400 tons for the Lehigh Valley, an indefinite tonnage for the Pennsylvania and some miscellaneous requirements. The Illinois Central has taken bids on some tonnage in the west.

Considerable new car building is in prospect, particularly among western railroads, and figures are about to be asked on some fairly good orders. Among these are the following: The Missouri Pacific railroad is preparing specifications on 2,000 steel gondolas; the Chicago, Burlington & Quincy railroad will shortly buy 1,000 steel coal cars; Swift & Co. will build 250 refrigerator cars at their own shops; the Mobile & Ohio railroad is asking for prices on 500 steel gondolas; the Chicago & North Western railroad is planning to buy 110 steel passenger cars.

CARS AND LOCOMOTIVES.

The Chicago & North Western has purchased 1,000 steel cars from the American Car & Fdy. Co. and 1,000 additional from the Western Steel Car & Fdy. Co.

The Great Northern has ordered 10 60-foot mail cars from Barney & Smith Car Co. and contemplates purchasing 105 additional passenger cars. The mail cars are all of steel and the other equipment will have steel underframes.

The Cambria & Indiana R. R. has purchased one locomotive from the Baldwin Locomotive Works.

San Pedro, Los Angeles & Salt Lake Ry. has ordered 36 switching locomotives from the Baldwin Locomotive Works.

The Chicago & Alton Ry. has placed an order for 5,000 tons of titanium open-hearth rails.

Pennsylvania railroad has ordered 46 locomotives, to be built in its own shops.

BRIDGE AND STRUCTURAL WORK.

Norfolk & Western Railroad, 4,000 tons, catenary supports for electrification project centering at Bluefield, W. Va. Inquiries issued.

Broadway Bridge, Boston, 300 tons; Boston Bridge Co. reported low bidder.

Public drawbridge over Passaic river at Millville, N. J., 600 tons. Bids taken.

Bridge for Michigan Central, 400 tons to American Bridge Co.

Baltimore & Ohio railroad, 4 000 tons of bridge work on Wheeling division. Bids close Oct. 24.

Pennsylvania railroad, two-track bridge across the Allegheny river at Kiskimonitas Junction. Bids issued. Tonnage indefinite.

Pennsylvania railroad, bridge over Erie railroad tracks at Lovell, N. Y., 600 tons. Bids entered.

Boston & Albany, 800 tons of bridge work awarded to the Pennsylvania Steel Co.

Delaware, Lackawanna & Western railroad, 6,500 tons bridge work in connection with new terminal at Buffalo; bids entered and awards shortly expected.

May Call for New Bids

Washington, Oct. 14.—A call for new bids for the proposed Lincoln memorial to be erected in Potomac park, this city, may result because of difficulties in connection with the contract which is to be made by the government. Arthur Cowsill, Washington, builder, has filed with Secretary of War Garrison a protest against the recent recommendation of the Lincoln Memorial Commission that the contract for building the memorial be awarded to the George A. Fuller Co., Washington and New York City. Mr. Cowsill asserts that he was the lowest bidder and that the contract should be his by right of law.

Sheet metal work for the 12-story Gwynne office building, Sixth and Main streets, Cincinnati, has been let to Herman & Grace, Brooklyn. Ernest Flagg, New York, is architect and Nils La Molmros, New York, is superintending construction.

AMERICAN MILLS

Will Make a Fight for Trade of the Pacific Coast.

San Francisco, Oct. 14.—That American mills do not propose to relinquish without a struggle any of the Pacific coast trade to foreign mills under the lower tariff conditions, is indicated by the action of the United States Steel Products Co. in announcing this week a sharp price cut in some of its schedules to apply to this territory. This company, which handles the business of the Steel Corporation upon the Pacific coast, has issued a new schedule quoting steel bars by mill shipment at 1.75c, base, c. i. f. San Francisco, equivalent to about 1.10c, Pittsburgh, by rail and water shipment. The former price was 2.05c, base, c. i. f. San Francisco. A corresponding cut has been made in warehouse prices on steel bars to 1.80c, San Francisco. Independent makers who sell upon the Pacific coast have not yet met the new price.

Foreign mills have been shipping considerable quantities of steel bars to the Pacific coast during the past four years, and at some periods the prices have been $4 a ton under those of domestic makers. These bars have usually come from Belgium and German mills, particularly the former.

Changes in Directorate

Important changes were made in the directorate of the American Shipbuilding Co. at the annual meeting held at Jersey City last week. W. L. Brown, chairman of the board, declined to stand for re-election and this office was left open for action to be taken at some future time. The other officers were re-elected.

The new directors chosen are Starr J. Murphy, Alfred L. Baker, Frederick A. Brown, H. A. Christy and A. A. Sprague 2nd. The directors succeeded were R. B. Wallace, the present general manager of the company; H. M. Hanna, P. A. McMillan, A. M. Joys and F. T. Gates. Starr J. Murphy, one of the new directors, is a New York attorney who is actively identified with the Rockefeller interests. He is the head of the Rockefeller Foundation, director of the Colorado Fuel & Iron Co. and president and director of the Tilden Iron Mining Co. He succeeds Mr. Gates, who is also a representative of the Rockefeller holdings in various corporations. The directors re-elected were L. M. Bowers, Wm. L. Brown, James H. Hoyt, Robert L. Ireland, Samuel Mather, H. H. Porter, Edward Smith, G. A. Tomlinson, James C. Wallace and R. C. Wetmore.

The officers re-elected, apart from Mr. Brown, were James C. Wallace, president; R. C. Wetmore, vice president and treasurer; O. J. Fish, secretary and assistant treasurer, and M. M. Chew, assistant secretary.

ORE RATE

Will be Investigated by Interstate Commerce Commission.

Washington, Oct. 15. (By wire.)—An order was entered this morning by the Interstate Commerce Commission that a proceeding of inquiry and investigation upon its own initiative will be made into ore rates from Lake Erie ports to points in Pennsylvania west of and including Johnstown, and to points throughout Ohio and West Virginia. This action is interpreted as meaning that the commission will endeavor to straighten the ore rate situation considered chaotic as an outcome of the Pittsburgh Steel Co. case with subsequent establishment of an 88-cent rate to Pittsburgh and Wheeling.

Dr. Diesel's Body Found

An Associated Press dispatch from Amsterdam under date of Oct. 12, says:

"The body of Dr. Rudolf Diesel, German motor inventor, was picked up in the mouth of the Scheldt, Saturday, by a boatman, who, after removing the valuables, was forced to throw it overboard again, owing to encountering heavy weather. The objects found and the clothing were identified today by a son of Dr. Diesel as belonging to his father."

Low Price on Pig Iron

Pittsburgh, Oct. 15. (By wire.)—The Standard Sanitary Mfg. Co. has closed for 1,500 tons of No. 2 foundry on the basis of $13.75, valley, and 750 tons of gray forge at $13.40, valley, for shipment during the remainder of the year for plants at New Brighton and North Side, Pittsburgh. Both prices are under the prevailing market.

The Salisbury Ball Bearing Mfg. Co., of Jamestown, N. Y., has decided to relocate in Olean, N. Y. C. W. Salisbury is president. The company will manufacture all kinds of countersunk ball and roller bearings. Work on the factory will begin in the spring.

ENGLISH STOCKS

Continue to Decline—Summary of Conditions in Recent Weeks.

New York, Oct. 14.—English pig iron stocks in the Middlesbrough and Cumberland districts continue steadily to decline. In the week ending Oct. 2 Middlesbrough stocks stood at 170,848 tons, a decrease in the week of 1,039 tons and in the year of 70,775 tons. The furnaces in blast numbered 81, compared with 83 a week prior and 87 on the corresponding date in 1912. Stocks in the Cumberland district Oct. 2 were 16,968 tons, a decrease in the week of 752 and in the year to date of 19,455 tons. Stacks in blast number 25, the same as the week previous, compared with 26 on the corresponding date in 1912. A summary of the stock conditions in the Middlesbrough and Cumberland district in recent weeks with the number of furnaces blowing shows the following:

MIDDLESBROUGH DISTRICT.

	Stocks.	Furnaces.
Oct. 2	170,848	81
Sept. 25	171,887	83
Sept. 18	175,803	85
Sept. 11	179,360	88
Sept. 4	183,140	89
Aug. 28	187,269	..
Jan. 1	241,623	..

CUMBERLAND DISTRICT.

Oct. 2	16,968	25
Sept. 25	17,720	25
Sept. 18	18,181	24
Sept. 11	18 829	24
Sept. 4	19,601	24
Aug. 28	19,761	..
Jan. 1	36,423	..

Death of Alex. Z. Newlin

Alex Z. Newlin, mechanical engineer of the Kewanee works of the National Tube Co., Kewanee, Ill., died of pneumonia, Oct. 7, at his residence there, aged 37 years. Mr. Newlin was born in McKeesport, Pa., and attended the public schools there, graduating from the high school in the class of 1895. After teaching school for three years, he went with the National Tube Co. in its engineering department at McKeesport. In 1901, he was transferred to the general engineering department, Frick building, Pittsburgh, and in October, 1908, was made mechanical engineer of the Kewanee works and moved to Kewanee. This position he filled until the time of his death.

An exceptionally bright and promising young man, capable, industrious and ambitious, his death at such an early age is greatly to be regretted. He is survived by a wife, two children, his father and several brothers.

Rebuilding of the burned plant of the Ohio Malleable Iron Co., Columbus, has been started.

IRON AND STEEL PRICES

Pig Iron

PITTSBURGH

(Through This Year.)

Bessemer	$16.65
Basic	14.90
No. 2 foundry	14.90
Malleable	15.15 to 15.40
Gray forge	14.40

(The freight from valley points is 90c.)

CLEVELAND

(Through This Year Delivered in City.)

No. 1 foundry	$15.00 to 15.50
No. 2 foundry	14.75 to 15.00
No. 2 southern	15.10 to 15.35
Bessemer	16.65
Silveries, 8 per cent silicon	18.55 to 19.05

CINCINNATI

(Fourth and First Quarters.)

Southern foundry No. 1	$14.75 to 15.25
Southern foundry No. 2	14.25 to 14.75
Southern foundry No. 3	13.75 to 14.25
Southern foundry No. 4	13.50 to 14.00
Southern gray forge	13.25 to 13.75
Mottled	13.25 to 13.50
Southern No. 1 soft	15.25
Southern No. 2 soft	14.75
Standard southern car wheels	27.25 to 27.75
Southern Ohio No. 2	15.20
Southern Ohio No. 3	14.70
Southern Ohio No. 4	14.45
Silveries, 8 per cent silicon	18.20 to 18.70

(Freight from Ironton, $1.20; from Birmingham, $3.25.)

CHICAGO

(Delivered Chicago, this year, except northern foundry and malleable Bessemer, which are quoted f. o. b. local furnace.)

Lake Superior char., No. 1 to 4	$15.75
Northern foundry No. 2	15.00
Southern foundry No. 2	15.85
Jackson co. silveries, 8 per cent	19.40
South'n silveries, 5 per cent sil.	17.35
Alabama basic	15.85
Malleable	15.00

PHILADELPHIA

(Prompt and third quarter shipment delivered to consumers' plants, in Philadelphia and vicinity, unless otherwise specified.)

Northern No. 1X foundry	$16.25 to 16.50
Northern No. 2X foundry	15.75 to 16.25
Northern No. 2 plain	15.50 to 15.75
Standard forge (Eastern Pa.)	15.00 to 15.25
Virginia No. 2X	15.80 to 16.05
Southern No. 2	15.00 to 15.50
Standard low phos., Phila.	23.00 to 23.50
Lebanon low phos., furnace	17.50 to 18.00
Malleable	16.75 to 17.00
Basic (Eastern and Central Pa.)	15.25 to 15.75
Middlesbrough, English No. 3 (on docks)	15.30 to 15.40

NEW YORK

(Prompt and third quarter delivery, prices based at Jersey City and tidewater.)

Northern No. 1X foundry	$16.25 to 16.50
Northern No. 2X foundry	15.75 to 16.25
Northern No. 2 plain	15.50 to 15.75
Virginia No. 2X	16.10 to 16.35
Southern No. 2	15.25 to 15.75
Malleable	15.75 to 16.00
Gray forge	14.75 to 15.00

ST. LOUIS

(Throughout This Year.)

Southern No. 1	$15.75 to 16.25
Southern No. 2	15.25 to 15.75
Southern No. 3	14.75 to 15.25
Southern No. 4	14.25 to 14.75

(Freight, Birmingham to St. Louis, $3.75.)

BIRMINGHAM

(For southern delivery.)

No. 1 foundry	$12.00 to 12.50
No. 2 foundry	11.50 to 12.00
No. 3 foundry	11.25 to 11.75
No. 4 foundry	11.00 to 11.50
Gray forge	11.00 to 11.50
Mottled	10.25
Standard basic	11.50
Off basic	11.00
Charcoal	25.00

BUFFALO

(Through this year, delivered in city.)

No. 1 foundry	$14.25 to 15.00
No. 2X foundry	14.00 to 14.50
No. 2 plain	14.00
No. 3 foundry	13.75 to 14.00
Gray forge	13.75
Malleable	14.00 to 14.50
Basic	14.50 to 14.75
Charcoal	15.50 to 16.50
Charcoal (special brands)	17.00 to 19.50

Ferro Alloys

English and German 80 per cent ferro-manganese, prompt and forward delivery, $50, seaboard.

Fifty per cent ferro-silicon on contracts, $75, Pittsburgh, or Philadelphia, for carloads; $74 for larger lots and $73 for 600 tons or more. Twelve to 13 per cent, $24. Eleven to 12 per cent, $23. Ten to 11 per cent, $22. Nine to 10 per cent, $21, f. o. b. Globe, Jisco and Ashland furnace. Freight to Pittsburgh, $1.90.

Ferro-carbon titanium 8 cents per pound for carload lots; 10 cents per pound for 2,000-pound lots and over; 12½ cents per pound in lots up to 2,000 pounds.

Freight rates on ferro-manganese, foreign spiegeleisen and electrolytic ferro-silicon from Baltimore to Pittsburgh, $2.16; to Youngstown $2.48; to Cleveland, $2.57; to Detroit and Columbus, $2.99; to Cincinnati, $3.40; to Chicago and Milwaukee, $4.00. Freights from Philadelphia and New York, 10 to 30 cents higher, respectively.

Freight Rates, Finished Material

From Pittsburgh, carloads, per 100 pounds, to:—

New York	16 cents
Philadelphia	15 cents
Boston	18 cents
Buffalo	11 cents
Cleveland	10 cents
Cincinnati	15 cents
Chicago	18 cents
Denver	84½ cents
St. Louis	22½ cents
New Orleans	30 cents
Birmingham	45 cents
Pacific coast, shapes and plates	80 cents

Coke

AT THE OVENS.

	Prompt shipment.	Contract.
Connellsville district:		
Foundry coke	$2.85 to 3.10	$2.85 to 3.10
Furnace coke	2.15 to 2.25	2.15 to 2.25
Wise county district:—		
Foundry coke	$2.75 to 3.50	$2.75 to 3.50
Furnace coke	2.25 to 2.50	2.35 to 2.50
Pocahontas district:—		
Foundry coke	$2.85 to 3.00	$2.85 to 3.00
Furnace coke	2.20 to 2.40	2.35 to 2.75
New River district:—		
Foundry coke	$3.25 to 3.50	$3.25 to 3.50
Furnace coke	2.60 to 2.75	2.60 to 2.90

Iron Ore

On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, prices are: Old range Bessemer, $4.40; Mesabi Bessemer, $4.15; old range non-Bessemer, $3.60; Mesabi, non-Bessemer, $3.40; al at lower lake ports.

Foreign iron ores, 7½ to 8 cents per unit, f. o. b. cars eastern seaboard. Freight rates from Philadelphia to eastern Pennsylvania furnace points range from 35 to 75 cents per ton.

Semi-Finished Material

PITTSBURGH

Bessemer 4 x 4 billets with 0.25 carbon and less, $23.00 to $23.50; open-hearth rolling billets, $23.00 to $23.50; Bessemer sheet bars, $24.00 to $24.50; open-hearth sheet bars, $24.00 to $24.50 f. o. b. Pittsburgh and Youngstown. Forging billets, $30, Pittsburgh. Wire rods, $27.00; muck bar, $30, Pittsburgh.

PHILADELPHIA

Delivered to consumers' plants in Philadelphia and vicinity; 4 x 4-inch open-hearth and Bessemer rolling billets at $25 to $26, and forging billets at from $30 to $31; muck bar, $28 to $30.

Standard Shapes

PITTSBURGH

Standard structural shapes, 1.35c to 1.45c. For extras see card of Sept. 1, 1909.

CHICAGO

Standard structural shapes, 15 inch and under, 1.58c to 1.63c.

PHILADELPHIA

Standard structural shapes, base sizes, delivered to consumers' plants in Philadelphia and vicinity, 1.50c to 1.55c.

NEW YORK

Standard structural shapes base sizes, delivered in metropolitan district, 1.51c to 1.56c.

Plates

PITTSBURGH

Standard steel plates ¼ inch thick, 6¾ to 100 inches, 1.35c to 1.40c. For extras, see card of Sept. 1, 1909.

CHICAGO

Tank plates, 1¼ inches thick, 6⅝ to 100 inches wide, 1.53c to 1.58c.

PHILADELPHIA

Tank plates, base sizes, delivered to consumers' plants in Philadelphia and vicinity, 1.50c to 1.55c.

NEW YORK

Tank plates, base sizes, delivered in the metropolitan district, 1.51c to 1.56c.

Sheets and Tin Plate

PITTSBURGH

No. 28 black	2.00c to 2.10c
No. 30 tin mill black	2.10c to 2.20c
No. 28 galvanized	3.05c to 3.10c
No. 10 blue annealed	1.55c to 1.60c
No. 28 painted corrugated	2.20c to 2.30c
No. 28 galvanized, corrugated	3.10c to 3.20c
Tin plate, 100-pound cokes	3.50c to 3.60c

PHILADELPHIA

Delivered to consumers' plants in Philadelphia and vicinity: No. 10 gage annealed sheets at 1.80c.

Pipe and Boiler Tubes

PITTSBURGH

	Black Butt.	Galv. Weld.
Steel, ¾ to 3 inches	80	71½
Iron, ¾ to 2½ inches	70	61
BOILER TUBES		
Steel, 3½ to 4½ inches	69	..
Iron, 3½ to 4½ inches	58	..

Other sizes of pipe and tubes take the usual advances as per official cards.

Rails and Track Material

PITTSBURGH

Steel rails, 50-pound and heavier, 1.25c per pound for Bessemer and 1.35c for open-hearth, carload lots; less than 500 tons 1.35c per pound; light rails on base weight of 40 to 45 pounds, 1.25c, schedule on the other weights being irregular and subject to negotiations; angle bars for standard sections, 1.50c, base, Pittsburgh; track bolts, 2.40c base, Pittsburgh.

Railroad spikes, 4½, 5 and 5½ and 9-16 inch, 1.65c.

CHICAGO

Light rails, carloads, 25 to 45-pound, 1.25c, base; 16 to 20-pound, 1.30c; 12-pound, 1.35c; 8-pound, 1.40c.

Light section relayers, 45 pounds and under, subject to inspection, $21.50 to $22.50; standard section relaying rails, subject to inspection, $23 to $24.

Track fastenings, f. o. b. Joliet:

Angle bars, 1.50c; railroad spikes, 1.70c; smaller size spikes, 1.85c base; track bolts with square nuts, 2.20c to 2.25c.

Bars, Hoops and Bands

PITTSBURGH

Common iron bars, 1.50c to 1.55c, Pittsburgh; Bessemer and open-hearth steel bars, 1.40c; plow and cultivator, 1.40c; channels, angles, zees, tees, under 3 inch, 1.50c, all f. o. b. mill.

Hoops, in carload lots, 1.60c, Pittsburgh; in less than carload lots, 1.65c; bands, 1.40c, base, with net extras, as per standard steel.

Cold rolled and ground shafting, 60 to 62 per cent off in carloads and 55 to 57 per cent in less than carloads delivered in base territory.

CHICAGO

Bar iron, 1.25c to 1.35c, hard steel bars rerolled, 1.45c; soft steel bars, bands and small shapes, 1.53c to 1.58c; hoops, 1.63c; smooth finished machinery steel, 1 inch and larger, 1.78c; shafting, 58 per cent off list for carload lots, 53 per cent off for less than carloads.

PHILADELPHIA

Delivered in consumers' plants in Philadelphia and vicinity: Steel bars, 1.55c to 1.60c on contract and common bar iron, 1.32½c to 1.42½c. Cut nails 1.80c to 1.90c. Philadelphia. Shafting 62 and 60 off in carloads and 57 and 55 off in less than carloads in base territory.

NEW YORK

Soft steel bars delivered in the metropolitan district, 1.56c; common iron bars, 1.32c to 1.45c.

Bolts, Nuts and Rivets

Rivets

Button head structural rivets, 1.90c, Pittsburgh, cone head boiler rivets, 2.00c. Small rivets, 75, 10 and 10 off.

Structural rivets, Chicago, 1.95c to 2.00c; boiler rivets, 0.10c extra.

Bolt and Nut Discounts

(Delivered within 20-cent freight radius.)

Carriage bolts, ⅜ x 6 inches, small and shorter, rolled threads, 75 and 10; cut threads, 75 and 5; larger and longer, 70 and 2½.

Machine bolts with hot pressed nuts, ⅜ x 4 inches, smaller and shorter, rolled 75, 10 and 5; cut, 75 and 10; larger and longer, 70 and 7½.

Gimlet and cone point lag or coach screws, 80 and 10.

Hot pressed square, blank or tapped nuts, $5.70 off list; hot pressed hexagon blank or tapped, $6.30.

Cold pressed C. & T. square, blank or tapped, $5.70 off; hexagon, blank or tapped, ¾-inch and larger, $6.60 off; ½-inch and smaller, $7.20 off.

Wire Products

PITTSBURGH

Wire nails, jobbers' carload lots, $1.60 to $1.65; retailers' carload lots, $1.65 to $1.70; cut nails (western makers), jobbers' lot, $1.65; painted barb wire jobbers' carload lots, $1.65 to $1.70; retailers' carload lots, $1.60 to $1.65; plain wire to jobbers in carloads, $1.40 to $1.45; and to dealers in carloads, $1.45 to $1.50; polished staples, $1.60 to $1.65; galvanized staples, $2.00 to $2.05.

CHICAGO

Wire nails, jobbers' carload lots, $1.83; retailers' carload lots, $1.85; retailers' less than carload lots, $1.93; painted barb wire, jobbers' carload lots, $1.83; retailers' carload lots, $1.88; retailers' less than carload lots, $1.93; with 40c for galvanizing; plain wire, jobbers' carload lots, $1.63; retailers' carload lots, $1.68.

Cast Iron Pipe

CHICAGO

Four-inch water pipe, $27; ½ to 12 inches, $26; larger sizes, $24; gas pipe, $1 a ton higher.

NEW YORK

Six-inch pipe, 30 pounds to the foot, $23 to $24, f. o. b. New York, in carload lots.

BIRMINGHAM

Water mains: 4-inch, $22.50; 6 to 8-inch, $20.50; larger sizes, $20. Gas main: $1 per ton higher than water mains. Special fittings, $47.50 to $52.50.

Old Material

PITTSBURGH

(Gross Tons Delivered.)

Heavy melting scrap	$12.25 to 12.50
Rerolling rails	13.50 to 14.00
Malleable	11.50 to 12.00
Bundled sheet scrap	7.75 to 8.25
Iron axles	24.50 to 25.00
Old iron rails	14.50 to 15.00
Stove plate	9.00 to 9.25
No. 1 wrought scrap	12.50 to 13.00
Old car wheels	12.75 to 13.00
Low phosphorus	14.75 to 15.25
Machine shop turnings	7.00 to 7.25
No. 1 busheling	10.50 to 11.00
Cast borings	8.00 to 8.25
No. 1 cast scrap	12.25 to 12.50

PHILADELPHIA

Gross tons delivered to consumers' plants, in eastern Pennsylvania and western New Jersey:

Old iron rails (nominal)	$17.00 to 17.50
Old iron rails (rerolling)	15.00 to 15.50
No. 1 heavy melting steel	11.00 to 11.50
Old car wheels	12.50 to 13.00
Old iron axles	25.00 to 26.00
Old steel axles	18.00 to 18.50
No. 1 railroad wrought	14.00 to 14.50
Wrought pipe	11.00 to 11.50
Cast borings	8.00 to 8.25
Machine shop turnings	7.50 to 8.00
Heavy cast (broken)	13.00 to 13.50
Malleable	11.50 to 12.00
Stove plate	10.50 to 11.00
No. 1 forge	9.50 to 10.00
Low phosphorus	15.50 to 16.00

Freight rates per ton on scrap from Philadelphia to principal eastern consuming points are: $0.60 to Ivy Rock, Pa.; $0.65 to Phoenixville, Pa.; $0.80 to Coatesville, Pa.; $0.85 to Bethlehem, Pa., Reading, Pa., and Roebling, N. J.; $1.10 to Pottsville, Pa., Lebanon, Pa., and Columbia, Pa.; $1.20 to Harrisburg, and Steelton, Pa.; $1.40 to Milton, Pa.

CLEVELAND

Gross Tons

Old iron rails	$12.50
Old steel rails (under 3 ft.)	12.00 to 12.50
Old steel rails (over 6 ft.)	12.00 to 12.50
Relaying rails	23.00 to 25.00
Old steel boiler plate	8.50 to 9.00
Malleable iron (railroad)	11.00 to 11.50
Axle turnings	6.50 to 7.00
Steel axles	16.50 to 17.00
Malleable iron (agricultural)	8.50 to 9.00
Heavy steel	10.25 to 10.75
Country mixed steel	8.50 to 9.00
Bundled sheet scrap	6.50 to 7.00

Net Tons

No. 1 R. R. wrought	$11.00 to 11.50
No. 1 busheling	9.00 to 9.50
No. 1 machine cast	11.00 to 11.50
No. 1 dealers' wrought	8.50 to 9.00
Machine shop turnings	4.00 to 4.50
Pipes and flues	7.50 to 8.00
Wrought drillings	4.00 to 4.50
Cast borings	5.25 to 5.75
Stove plate	8.00 to 8.25
Wrought iron arch bars	13.00
Wrought iron piling plate	13.00

CHICAGO

(Delivered in consumers' yards.)

Gross Tons

Old car wheels	$12.00 to 12.50
Old iron rails	13.75 to 14.25
Rerolling rails (5 ft. and over)	12.00 to 12.50
Old steel rails (3 ft. and und.)	11.25 to 11.75
Frogs, switches and guards	10.50 to 11.00
Heavy melting steel	10.50 to 11.00
Shoveling steel	10.00 to 10.50

Net Tons

No. 1 R. R. wrought	$ 9.75 to 10.25
No. 2 R. R. wrought	8.50 to 9.00
Arch bars and transoms	13.00 to 13.50
Knuckles, couplers and springs	10.75 to 11.25
Shafting	14.25 to 14.75
Iron car axles	20.25 to 20.75
Steel car axles	14.50 to 15.00
Locomotive tires	11.75 to 12.25
Dealers'' forge	8.50 to 9.00
Pipe and flues	7.50 to 8.00
No. 1 cast	10.75 to 11.25
No. 1 busheling	8.25 to 8.75
No. 2 busheling	6.50 to 7.00
No. 1 boiler cut	8.25 to 8.75
Boiler punchings	12.00 to 12.50
Cast and mixed borings	5.25 to 5.75
Machine shop turnings	4.50 to 5.00
Railroad malleable	10.50 to 11.00
Agricultural malleable	10.00 to 10.50
Angle bars, splices, etc., iron	13.00 to 13.50
Angle bars, steel	9.00 to 9.50
Stove plate and light cast scrap	8.75 to 9.25

NEW YORK

Gross tons, New York dealers' prices at tidewater, usually for eastern Pennsylvania delivery:

Old car wheels (nominal)	$10.50 to 11.00
Heavy steel axles	15.25 to 15.50
Steel shafting	14.50 to 15.00
No. 1 heavy melting steel	9.00 to 9.20
No. 1 R. R. wrought	12.00 to 12.25
Wrought pipe (not galvanized)	9.00 to 9.25
Cast borings	6.00 to 6.50
Machine shop turnings (nominal)	5.50 to 6.00
Heavy cast	11.25 to 11.50

Stove plate	8.00 to 8.50
Grate bars	6.25 to 6.50

Freight rates on scrap per ton to Steelton, Pa., Columbia, Pa., Pottsville, Pa., and Harrisburg, Pa., are $1.50 from Jersey City, and $2.00 from New York; to Coatesville, Pa., Ivy Rock, Pa., Phoenixville, Pa., and Reading, Pa., $1.50; from Jersey City, and $1.80 from New York; to Bethlehem, Pa., $1.10 from Jersey City, and $1.60 from New York; to Roebling, N. J., $1.00 from Jersey City, and $1.50 from New York; to Milton, Pa., $1.60 from Jersey City, and $2.00 from New York; to Jersey City, $1.00 from New York; to Newark, $1.10 from New York.

CINCINNATI

Gross Tons

Old iron rails	$11.00 to 11.50
Old steel re-rolling	9.50 to 10.00
Old iron axles	15.50 to 16.00
Heavy melting scrap	8.50 to 9.00
Relaying rails	18.50 to 19.00

Net Tons

Old No. 1 R. R. wrough	$ 8.50 to 9.00
Bundled sheet scrap	4.50 to 5.00
No. 1 yard wrought	6.50 to 7.00
No. 1 machine cast	9.00 to 9.50
No. 1 busheling	6.50 to 7.00
Stove plate	6.25 to 6.75
Machine shop turnings	4.50 to 5.00
Cast borings	4.00 to 5.00
Heavy turnings	5.00 to 5.50
Mixed cast	7.50 to 8.00
Breakage	5.00 to 6.00
Malleable	6.50 to 7.00

BIRMINGHAM

Old iron axles (light)	$15.00 to 15.50
Old steel axles (light)	15.00 to 15.50
Old iron rails	12.50 to 13.50
No. 1 R. R. wrought	12.00 to 12.50
No. 2 R. R. wrought	10.00 to 10.50
No. 1 country wrought	9.50 to 10.00
No. 2 country wrought	8.50 to 9.00
No. 1 machinery cast	10.50 to 11.00
No. 1 steel scrap	10.50 to 11.00
Standard car wheels	12.00 to 12.50
Tram car wheels	10.50 to 11.00
Light cast and stove plate	9.00 to 9.50

BUFFALO

Gross Tons

Heavy melting steel	$10.50 to 11.00
No. 1 R. R. wrought scrap	13.00 to 13.50
No. 1 R. R. and mch. cast scrap	13.00 to 13.50
Old steel axles	17.00 to 17.50
Old iron axles	22.50 to 23.00
Car wheels	12.50 to 13.00
Railroad malleable scrap	12.00 to 12.50
Machine turnings	6.00 to 6.50
Heavy axle turnings	8.00 to 8.75
Cast iron borings	6.25 to 6.75
Low phos. steel scrap	16.50 to 17.00
Old iron rails	15.00 to 15.50
Boiler plate, sheared	12.50 to 13.25
Bundled sheet scrap	8.00 to 8.50
Stove plate (net ton)	9.75 to 10.00
Locomotive grate bars	10.00 to 10.50
No. 1 busheling scrap	10.50 to 11.00
No. 2 busheling scrap	8.00 to 8.50
Wrought pipe	9.50 to 10.00

ST. LOUIS

(Dealers' buying prices.)

Gross Tons

Old car wheels	$10.75 to 11.25
Old iron rails	11.50 to 12.00
Re-rolling rails (5 ft. and over)	11.00 to 11.50
Old steel rails (3 ft. and und.)	9.50 to 10.00
Light sec. relayers (45 pounds and und.) subject to inspec.	23.50 to 24.00
Relaying rails, subject to inspec.	23.50 to 24.00
Frogs, switches and guards	9.00 to 9.50
Shoveling steel	8.50 to 9.00

Net Tons

No. 1 railroad wrought	$9.50 to 10.00
No. 2 railroad wrought	9.00 to 9.50
Arch bars and transoms	12.50 to 13.00
Knuckles, couplers, springs	8.50 to 9.00
Shafting	13.00 to 13.50
Steel car axles	14.50 to 15.00
Iron car axles	17.50 to 18.00
Locomotive tires	10.50 to 11.00
Pipe and flues	6.50 to 7.00
Tank iron and cut boilers	6.50 to 7.00
No. 1 cut busheling	8.50 to 9.00
Cast iron borings	3.50 to 4.00
Machine shop turnings	4.50 to 5.00
Railroad malleable	8.00 to 8.50
Agricultural malleable	6.50 to 7.00
Stove plates	7.50 to 8.00
Angle splice bars (iron)	10.50 to 11.00
Angle splice bars (steel)	8.50 to 9.00

Store Prices

CINCINNATI

Steel bars, 1.95c to 2c; iron bars, 1.85c to 1.90c; plates and shapes, 2.05c to 2.10c; sheets, blue annealed No. 10, 2.15c to 2.20c, black, No. 28, 2.65c; galvanized, No. 28, 3.75c; cold rolled shafting, round, square, hexagon and flat 53 to 55 off.

CLEVELAND

Steel bars, 2.00c; plates and shapes, 2.10c; iron bars, 2.00c; sheets, No. 16 blue annealed, 2.40c; No. 28 black, 2.85c; No. 28 galvanized, 3.95c.

CHICAGO

Steel bars, 1.85c; iron bars, 1.85c; hoops, 2.50c; shapes and plates, 1.95c; No. 10 blue annealed sheets, 2.15c, black, No. 28, 2.75c; galvanized, No. 28, 3.80c.

PHILADELPHIA

Steel bars, 1.85c to 1.90c; structural shapes, 2.00c; plates, 2.00c.

NEW YORK

Steel bars, 2.00c; structural shapes, 2.05c; plates, 2.05c.

Being Rapidly Filed

Washington, Oct. 15. (By wire.)—Practically all of the big trunk lines of eastern carriers have completed the filing of new tariffs proposing a 5 per cent freight rate advance east of the Mississippi and north of the Ohio and Potomac rivers.

With the tariffs filed, an immediate suspension is expected to be ordered by the commission, although it may be a short period will elapse before such an order is actually made. The new tariffs are all filed to become effective Nov. 15.

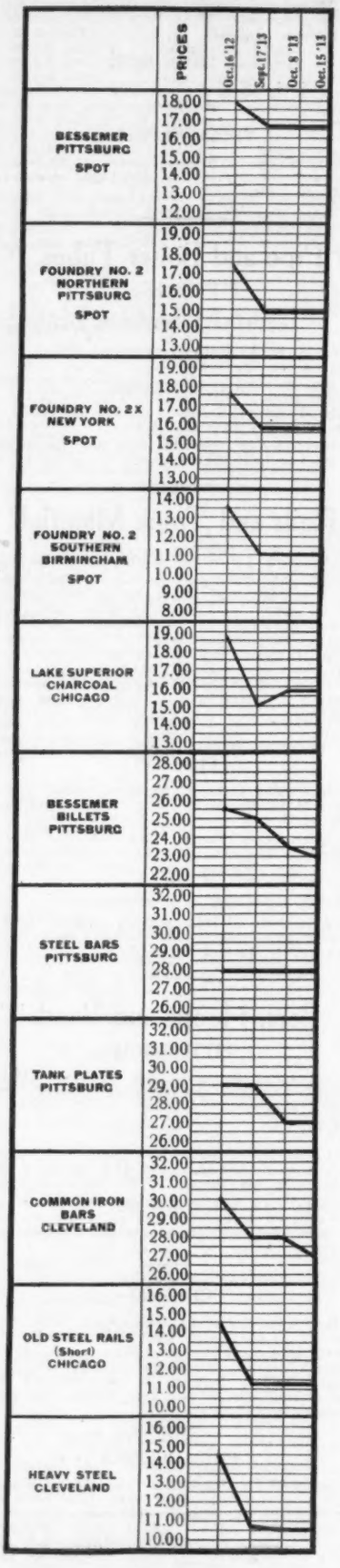
Preliminary hearings, which will mark the opening of one of the most important cases in freight rate history, probably will begin the latter part of November; and, even if the carriers should be victorious in their contentions, it seems unlikely the rates will be applied before next spring.

An array of the most prominent railroad legal talent in the country will support the claims of the carriers, while Attorney Louis D. Brandeis will represent the commission to fortify it with facts, and shippers will have prominent attorneys appearing in their behalf.

The Swedish Crucible Steel Co., Hamtramck, Detroit, advises it has contracted for most of its equipment but is in the market for facing mills, emery wheels, sawing machines, sand blast and welding equipment.

A strike of the elevator constructors' union against the Warner Elevator Co., Cincinnati, has been settled after being in progress since the first of May.

PRICE CHART



FOREIGN MARKETS

GERMAN IRON TRADE

Berlin, Oct. 1.

The German iron and steel markets have been weak throughout the month. New orders have been difficult to secure and prices have been steadily declining. Recently fresh reductions have been established. Steel bars are now officially quoted 96 marks to 100 marks ($22.56 to $23.50) per ton; steel hoops, 125 marks ($29.37½); steel plates, 108 marks ($25.38); boiler plates, 118 marks ($27.73); sheets, 124½ marks ($29.25¾). For export, steel rods are now 94s ($22.88); hoop iron, 126s ($30.67); sheets No. 20, 130s ($31.64); ordinary wire No. 0/8, 122s 6d ($29.82), and wire nails No. 0/7, 6s 6d ($1.58) per keg, all f. o. b. Antwerp. Steel plates are said to be selling as low as 102 marks ($23.91), and steel bars at 95 marks ($22.32½), while transactions are reported down to 92 marks ($21.62). Altogether the market has become irregular and erratic. Recently prices were reduced 5 marks ($1.17½) per ton for delivery during the last quarter of the year, bringing ingots to 82½ marks ($19.38¾); billets to 95 marks ($22.32½); sheet bars to 97½ marks ($22.91¼), with a bonus of 15 marks ($3.57½) per ton for export. This reduction puts half-products 10 marks ($2.35) per ton below the prices obtained a year ago. Girders have been lowered 5 marks to 110 marks ($1.17½ to $25.85), but the building trade is still so depressed that it is not expected that this price level will encourage the placing of any volume of orders.

The export statistics published recently indicate that depression has at last affected the foreign business to a greater extent than in any month previously to August inasmuch as the excess of exports over imports is the smallest of any month since August last year. It amounts to 438,000 tons against 481,000 in July, 494,000 in June, 497,000 in May, 510,000 in April, and 588,000 in March. The total exports were also the smallest of any month within a year with 488,000 tons against 541,000 in June, while in the banner month, March, it amounted to 603,000 tons.

The recent balance sheet of the Phoenix Co., Hoerde, in Westphalia, one of the leading German coal and iron companies, disclosed a net profit of 32,193,424 marks ($7,565,454.64), against 29,027,225 marks ($6,821,397.87) last year, and proposed a dividend of 18 per cent, as before. The capital is 106,000,000 marks ($24,910,000).

FRENCH IRON TRADE

Paris, Oct. 1.

Considerable development proceeds in the iron trade of this country. The Societe Senelle-Maubeuge, which has amalgamated with the Societe Villerupt-Laval-Dieu, has a steel output exceeding 1,000 tons a day at the Longwy Works, which are among the most up-to-date in the Meurthe et Moselle district, while its works at Maubeuge include extensive rolling plant and an iron foundry with a monthly capacity of about 1,000 tons. The works employ over 3,200 men at these two works and possess iron ore concessions with an area of 425 hectares in the Briey Basin. The Societe de Villerupt-Laval-Dieu has three blast furnaces at Villerupt and open-hearth furnaces, foundries, puddling furnaces and rolling mills for steel plate and sheet at Laval-Dieu in the Ardennes. It further owns the Fillieres iron concession, extending over 805 hectares. The amalgamation will permit the Societe Senelle-Maubeuge to undertake the manufacture of steel sheets, which hitherto have not been among its specialties, and to this effect changes are contemplated at the Laval-Dieu Works. Improvements are also being carried out at the Longwy Works, among them being the construction of a large central power station, with three units of 2,500 horsepower each, driven by engines supplied with gas from the blast furnaces.

In order to develop the manufacture of finished steel articles the Acieries de Denain-Anzin has acquired the Societe des Tubes de Valenciennes, which is engaged in the production of tubes and fittings.

Hope for U. S. Business

Birmingham, Eng., Oct. 4.—A good deal is expected in Sheffield from the tariff changes now decided upon in the United States. A number of enterprising Sheffield firms have established agencies in America, and taken other steps to prepare for new business, when it comes along. The makers of high-speed and other special steel look forward to considerable increase of the already large business they do with America. The tool trade in Sheffield at the present time is busy.

BELGIAN IRON TRADE

Brussels, Oct. 1.

Recently it was hoped that the iron trade was about at its turning point. Prices had reached a level that attracted more inquiries and both German and American reports were rather more cheerful. The trade was, however, soon disillusioned, German competition became more severe than ever, and the demand promptly withdrew. The result has been a fortnight of inactivity and efforts to attract new business have resulted in steadily declining prices, so that now steel bars are easily obtained at £4 12s ($22.39) and iron bars at £4 16s ($23.37), business being stated to have been done even at lower figures. Rods are obtainable at £5 1s ($24.58½); girders at £5 10s to £5 11s ($26.77 to $27.02); steel plates, ¼ inch thick, at £5 5s ($25.56); steel plates, ⅛ inch thick, at £5 7s ($26.04); steel plates, 1/16 inch, £5 11s to £5 12s ($27.02 to $27.26), all f. o. b. Antwerp. Among the orders secured recently are 800 freight cars for Brazil. Pig iron is equally depressed, Thomas O. M. iron selling at 65 francs ($12.35), and Luxemburg puddling iron at 62 francs ($11.78) per ton. It is reported that an order for 12,000 tons of steel rails secured some short time ago has recently been cancelled.

RUSSIAN IRON TRADE

St. Petersburg, Oct. 1.

One may, as usual, state without further comment that the Russian iron market is strong. The price of section iron is 1 rouble 44-53 copecks (73-77½ cents) per pood (36 pounds); girder iron, 1r. 46-54c. (74-78 cents); tank iron, 1r. 60-65c. (81-83½ cents) per pood; roofing iron, 2r. 10-20c. (107-112 cents) per pood ex factory; pig iron, 70-72c. (35-36 cents) per pood ex factory. Orders received by the Metallurgical Works Syndicate, show a great advance on the orders received during the preceding year for the first eight months. The total for 1913, January-August, inclusive, is 84,939,403 poods against 78,601,821 poods in the corresponding eight months of 1912. Large increases are noted in sheet iron, tires, section iron, and rails with axles, but there is a great decline in girders, which has been a feature of the industry during the whole of this year and is very difficult to explain.

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Cleveland, October 16, 1913

Putting New York on the Iron Map

Possibilities of an important change in the geographical drift of iron and steel production in the United States are contained in the interesting announcement of a plan to build a modern blast furnace plant upon New York harbor which appears in this issue.

For years the immediate metropolitan district has been regarded as possessing few of the necessary advantages for iron and steel manufacture upon a large scale. Such efforts as have been made to establish a manufacturing zone of this character have met with indifferent, and, in one important case, with disastrous, results. The means now being provided for very cheap transportation of raw materials promise in a considerable measure to alter this condition.

The most important of these plans concern the construction of the New York state barge canal and the enlarged Champlain canal now under way. These enlarged waterways, it is expected, will enable the transportation by barge of sizable tonnages of iron ore both from Buffalo and the Port Henry districts at an extremely low cost of haul. What a radical effect the building of these canals is expected to accomplish is reflected by the statement that under the promised rate of 50 to 75 cents per ton from Buffalo, Lake Superior ore can be laid down at New York harbor cheaper than in the Pittsburgh district at the latter's present rail rate from lower lake ports. The Port Henry district, with its vast deposits of magnetite ore, is likely to offer an even cheaper base of supply through the Champlain canal. Furthermore, a location on tidewater will afford these furnaces a minimum cost of transportation on foreign ores now freely used in the mixtures of many eastern Pennsylvania furnaces. The establishment of a by-product coke plant is expected to solve the fuel problem.

A cause commonly ascribed for the failure of the efforts to make steel in New York harbor in a tonnage way has been the high cost of pig iron laid down in that district. A different complexion might be put upon this problem, were pig iron making to be established in the immediate vicinity under the very favorable conditions of raw material costs as heretofore set forth. The successful carrying out of a merchant blast furnace proposition on New York harbor, accordingly, is directly related to the possibility of the upbuilding of steel manufacture there in a way that may warrant considerable recognition from the well-known steel centers in the years to come.

Progress of Civilization and Trade

Nearly two weeks have passed since the Underwood tariff bill was signed and made a law by the president, and very little, if any, effect is yet noticeable in the iron and steel trade, except that consumers are more disposed to defer buying. Perhaps the most important development has been the issuing of statements by Chairman Topping and others showing that there is no cause for great anxiety at the present time. That the manufacturers of Great Britain do not expect to be permitted to come into this country and to largely increase their business is clearly shown by a noteworthy editorial published in *The Ironmonger*, of London, as follows:

"The question whether the alterations in the United States iron and steel duties will stimulate exports from this country or from the continent of Europe is one of considerable interest. If such a tariff as is now coming into force had been enacted 25 or 30 years ago, there can be no doubt that it would have been of great importance to British trade; but the conditions are now entirely changed. The United States then made only about 10 per cent of the world's iron and steel, whereas now they make about 50 per cent. They have passed through the period when they could only work under the protection of a prohibitive customs tariff, and they would now be well able to abolish duties altogether if they desired to do so. Take, for instance, the reduction in the duty on bar steel from 12 per cent to 5 per cent. The price of bar steel in the United States is at the moment lower than it is in this country, and has been so for about two years. The same may be said of bar iron, of rails, of plates, and of other materials of this class; and yet, when the old tariff was set up, American manufactures of this kind were twice as dear as those of Europe. It is fairly obvious, therefore, that no imports from this side are likely to be possible

as a result of these particular reductions in the United States tariff. The main export business in iron from Great Britain to the states consists of special classes of pig iron, the value of which in 1912 is given as $3,153,000, or, say, roughly £650,000. Our tin plate exports to the states, which were not so very long ago of great importance, have dwindled to about £50,000 worth yearly. The duty on tin plate has been reduced from about 32 per cent to 15 per cent, and it is possible that some little increase in business may result, but no great expansion can be expected. The fact is that the American iron and steel trade is preparing, not to admit foreign competition, but to invade the outside markets of the world; and it will probably be enabled to do this by the cheapening of the costs of production through the lowering of the duties upon goods generally and the consequent reduction in the cost of living in the states."

The most significant part of this editorial is the concluding paragraph. While we believe foreign competition will be admitted to a greater extent than in the past, it is also true that Americans will make a greater effort than ever to increase their exports to important markets of the world. This will be done by improved methods and greater activity. Whether the lowering of duties on raw materials and semi-finished products will have much effect on the cost of production, remains to be determined.

The *Ironmonger* does not become excited or predict any international commercial warfare, but it clearly looks forward to the steady expansion of American trade. This expansion may be to a very large extent to countries whose demands are rapidly growing greater. The recent report in regard to our commerce to South American republics shows an increase of 176 per cent last year. If this large growth in business were analyzed, it would probably be found that while the United States gained, other nations also increased their exports, because consumption increased. With the awakening in China to a larger life, the demand for all kinds of American products is certain to be augmented, and an improved civilization in the Philippines and in other far distant countries will call for much greater supplies of all kinds of products used by highly civilized men. With the extension of civilization, commerce is certain to increase and great exporting nations will profit thereby.

Heavier Loading of Cars

The increase which has taken place in the last ten years in the average carrying capacity of freight cars has not resulted in a proportionate increase in the average load. According to a table published in the *Railway and Engineering Review,* the average carrying capacity of freight cars of 28 of the most important railroads of the United States increased 9.18 tons per car, or 33.46 per cent, while the average number of tons of revenue freight per loaded car increased only 3.47 tons or 21.36 per cent during the decade. In other words, a large part of the increased capacity has not been used in practice, while the cost of hauling the extra dead weight and the cost of maintenance have increased. This disappointing result has caused general complaint. More powerful engines and larger cars have failed to accomplish the expected economies and shippers and railroad operators alike are disappointed.

We have received a communication from a student of this question discussing it at length and going fully into its technical phases. Our correspondent states that the reason for the loading not keeping pace with the increase in the capacity of cars is that the railroads have failed to recognize that commercial conditions always have and always will limit the size of carload units because many shippers will ship as little as is necessary to get the carload rate. The second reason is that to a certain extent with all commodities increased loading per car means increased expense which the railroads have not been disposed to share with the shipper. As a solution of the difficulty, our correspondent suggests graduated minimum weights with a corresponding scale of rates. For instance, from Seattle to New York the table of rates on lumber would begin with a minimum weight of 300 pounds on which the rate would be $2.25 per 100 pounds, and would provide for a gradual increase in minimum rates until for a minimum of 80,000 pounds the rate would be 50 cents per 100 pounds. By the same method, graduated weights would be established in the opposite direction, westbound.

Our correspondent says that there can be no question that the necessity for a revolution in the making of all-rail rates to the Pacific coast is emphasized by the reduction in the import tariffs that has been put into effect, making it possible for the German and Belgium steel manufacturers to compete for the Pacific coast trade much more successfully than in the past, unless very much lower rates of transportation can be applied. While our correspondent does not oppose an advance in freight rates, he endeavors to show that profits can be increased by increasing carloads. "It would seem," he says, "that this problem of heavier loading of cars is of such vital importance to the railroads themselves that they might well afford to take it up in the American Railway Association and establish a heavier loading bureau in charge of a commission whose duty it should be, not to compile statistics, but rather to start a thorough campaign for heavier loading of equipment."

As demonstrating concretely what can be accomplished by increasing the average carload, statistics show that during the year 1911 the average carload of outgoing freight to constituent companies of the United States Steel Corporation in the Pittsburgh district was 34.6 tons, and for 1912, the average carload was 36.2. This increase of 3,200 pounds to the average carload on outbound shipments enabled the railroads to handle the business with 76,105 fewer cars. One company saved 122 cars by loading only 100 pounds heavier per car during the year 1912. If all the shippers in the Pittsburgh district had increased their average load to the same extent as the ten companies of the Corporation, the tonnage could have been moved in 490,524 fewer cars.

Shortage of cars is one of the most embarrassing things with which business has to contend and methods of bringing about heavier carloads are entitled to the careful consideration of both the railroads and the shippers.

CAR BUYING

Hoped For by Builders—Orders in 1913 Show Decline.

Unless a decided increase comes in new buying soon, car builders believe that not more than 100,000 cars will have been placed during 1913. The total may not reach that high. In the nine months up to Oct. 1, it is estimated that about 88,000 cars were placed. In September, the contracts called for only about 2,000 cars. In 1912 about 235,000 cars were purchased.

The orders closed during the present year to date, with the number of cars purchased during each month, are as follows:

Month, 1913.	Total placed.
January	30,000
February	22,000
March	5,000
April	13,500
May	10,000
June	2,500
July	1,000
August	2,000
September	2,000
Total to Oct. 1	88,000

It will be noted from this table that all but a small fraction of the total was purchased during the first five months of the present year. Orders during that period reached 80,500, leaving but about 7,500 cars to be placed during the months of June, July, August and September.

No indication appears at present when the extreme dullness in railroad equipment purchases will be broken. The tight money market generally is accepted as the cause for the present inactivity in this line, and it is a mere matter of conjecture as to when this condition will be removed. Should the railroads in eastern territory be successful in obtaining a 5 per cent advance in freight rates, this factor doubtless will go a long way toward stimulating more liberal buying.

The general position of the railroads indicates that they will need large quantities of additional equipment when they can see their way clear to purchase them. In fact, a good many thousand cars are being talked of for different systems, but none of this is reaching a definite stage of negotiations and nothing shows how soon it will. The New Haven and affiliated roads alone are credited in these reports with a probable purchase of 10,000 to 12,000 cars. Actual inquiries at the moment are few and aggregate not to exceed 3,000, the largest of which is that of the Chicago & North Western railroad, for 2,000 to 2,500 cars.

Veteran Retires.—Completing 40 years of continuous service with the United States Steel Corporation, Morgan Harris, 71 years old, last week was retired and given a banquet at the Carnegie hotel. He had charge of a forging press in the armor plate department at the Homestead plant. A gold watch was presented.

LACKAWANNA REPORT

Shows Increase in Quarter Earnings of $96,528.

Profits of the Lackawanna Steel Co. and its subsidiaries for the third quarter, ended Sept. 30, were $1,109,203, compared with $1,012,675 the preceding quarter and $386,256 the corresponding quarter in 1912. For the nine months of the year ended Sept. 30, the company's total profits were $3,131,599, compared with $21,031 for the corresponding period in 1912, or an increase of $3,110,568.

The unfilled tonnage of the company fell off during the quarter 180,730 tons, and on that date stood at 255,945 tons. This compares with 569,977 tons on Sept. 30, 1912. The unfilled tonnage of the company by quarters since Sept. 30, 1912, has been as follows:

Sept. 30, 1912	569,977
Dec. 31, 1912	626,996
Mar. 31, 1913	623,816
June 30, 1913	436,675
Sept. 30, 1913	255,945

The reports for the third quarter and of the nine months of the year to date compared with the corresponding periods of 1912, are as follows:

Third Quarter

	1913.	Increase.
Inc. from mfg.	$1,839,514	$805,570
Other income	168,210	*52 832
Total	2,007,724	752,739
Interest on bonds	437,417	*70
Balance	1,570,307	752,809
Sinking funds	113,495	4,554
Dep. and renewals	347,609	25,308
Total deductions	461,104	29,862
Profit	1,109,203	722,947

Nine Months

	1913.	Increase.
Income from mfg.	$4,965,466	$3,116,414
Other income	555,727	*51,037
Total	5,521,193	3,065,377
Interest on bonds	1,312,328	*142
Balance	4,208,865	3,065,519
Sinking funds	345,200	74,489
Dep. and renew.	999,266	147,662
Total deductions	1,344,466	222,151
Profit	2,864,399	2,843,368
Special profit on sale of assets of subsidiaries.	267,200	267,200
Total profit	3,131,599	3,110,568

*Decrease.

Case School of Applied Science, Cleveland, is to erect a building for the Wood & Spencer Co., engineers and manufacturers of machinery, now at 5518 Euclid avenue. The building is to be 60 x 100 feet, four stories and fireproof. It is erected as an income investment.

ANNOUNCE PROGRAM

For Chicago Meeting of American Iron and Steel Institute.

The fifth general meeting of the American Iron and Steel Institute will be held at the Blackstone, Chicago, Oct. 24. The general committee consists of James A. Farrell, chairman; E. A. S. Clarke, John C. Maben, Charles M. Schwab, John A. Topping and Frank S. Witherbee. The Chicago committee includes: Eugene J. Buffington, chairman; M. Cochrane Armour, L. E. Block, Eugene B. Clark, Robert P. Lamont, Cyrus H. McCormick, Herbert F. Perkins. The program is announced as follows:

Forenoon Session, 10:00 a. m.

Address by the president, Elbert H. Gary.

"Fuel Possibilities in Steel Making," by William Whigham, assistant to president, Carnegie Steel Co., Pittsburgh.

Discussion, William G. Kranz, general manager, National Malleable Castings Co., Sharon, Pa.

"Treatment of Blast Furnace Flue Dust," by Eugene B. Clark, vice president and general manager, American Sintering Co., Chicago.

Discussion, John W. Dougherty, president, Pittsburgh Crucible Steel Co., Pittsburgh.

Discussion, B. G. Klugh, American Ore Reclamation Co., New York.

"The Use of Refractories in the Iron and Steel Industry," by Harry W. Croft, president, Harbison-Walker Refractories Co., Pittsburgh.

Discussion, A. N. Diehl, superintendent, blast furnaces, Carnegie Steel Co., Duquesne, Pa.

A buffet lunch will be served at the close of the session.

Afternoon Session, 2:00 p. m.

"The History and Problems of the Steel Wheel," by John C. Neale, structural engineer, Carnegie Steel Co., Pittsburgh.

Discussion, D. F. Crawford, general superintendent of motive power, Pennsylvania lines west, Pittsburgh.

"Progress in Roll Design," by T. H. Mathias, assistant general superintendent, Lackawanna Steel Co., Buffalo.

Discussion, Harry L. James, superintendent, roll department, American Bridge Co., Pencoyd, Pa.

"Extras—The Reason and Necessity Therefor," J. L. Replogle, vice president, Cambria Steel Co., Johnstown, Pa.

Discussion, Henry P. Bope, first vice president Carnegie Steel Co., Pittsburgh.

Discussion, John L. Haines, assistant to vice president, Jones & Laughlin Steel Co., Pittsburgh.

Discussion, Charles R. Robinson, general manager of sales, Lackawanna Steel Co., Buffalo.

Evening Session, 7:00 p. m.
Dinner.

Crystal Ball Room, The Blackstone.

"Vocational Edueation," by Theodore W. Robinson, vice president, Illinois Steel Co., Chicago.

Discussion, Stephen W. Tener, manager, accident and pension department, American Steel & Wire Co., Cleveland.

Remarks by the president, Elbert H. Gary.

Impromptu addresses in response to call of Judge Gary.

A visit to the Gary works of the Illinois Steel Co., Gary, Ind., will be offered Saturday, Oct. 25, a special train leaving the LaSalle street station of the Lake Shore & Michigan Southern railway at 10 o'clock in the forenoon, returning to Chicago in time for all evening trains.

The Foundry and Machine Exhibition at Chicago

A Summary of the World's Greatest Industrial Exposition Epitomizing the Year's Progress by Manufacturers of Foundry and Shop Equipment

Concurrent with the annual meetings of the American Foundrymen's Association, American Institute of Metals and the Associated Foundry Foremen, which convened at the La Salle hotel, Chicago, Tuesday, Oct. 14, is being held an exhibition of foundry supplies and equipment, machine tools, etc., at the International Amphitheatre, Forty-third and Halsted streets, Chicago, that surpasses, both in number of individual displays and floor area occupied, any similar show previously conducted in this country. In addition to the main area of this spacious exhibition building, four structures are crowded with foundry, machine and pattern shop machinery and with few exceptions this machinery is in operation.

The exhibition, which was opened on Friday morning, Oct. 10, is being conducted under the auspices of the Foundry & Machine Exhibition Co. The floor area occupied by the 169 individual displays aggregates nearly 65,000 square feet and the value of the equipment shown is estimated approximately at several million dollars.

The attendance already has greatly exceeded expectations and the business transacted by the companies represented is exceedingly gratifying. The show will be continued until Friday night, Oct. 17, although the convention of the allied foundrymen's organizations will close on the preceding day.

Machine Tools

With 36 individual exhibits of machine tools, the progress of the past year in the design and construction of metal-working machinery is amply illustrated. The exhibits include working displays of all kinds of metal and woodworking machines. In spite of the great increase in the strength and power of machine tools in the past few years, it is evident that customers are not yet wholly satisfied in this direction. The demand for higher speeds and greater cutting ability is apparently as insistent as ever, but the demonstrations at the show made it plain that the machines now on the market have sufficient power to crumple any grade of tool steel without stalling. Therefore, further progress toward greater capacity must come from the tool steel makers.

The principal improvements of the past year in standard lathes, shapers, drill presses and milling machines include refinements in methods of motor drive, a simplification of the feed and speed change mechanism and advances in the direction of better finished machines and more handy arrangement for the convenience of the operator. Variable speed, direct current motors which reduce the amount of gearing necessary between the source of power and the working spindle are growing in favor, but there is also a tendency toward the adoption of squirrel cage induction motors due to the fact that in many localities direct current is not available without the use of motor generators. No machine tool is considered up-to-date at present unless the motor is sufficiently large to start the machine at any time under full load. In the latest motor-driven machine tools, all that the operator has to do in starting is to throw over a lever located in a convenient place on the machine or operate a push button. Automatic, magnetic starters regulate the proper input of current to the motors. This eliminates a great deal of trouble through burned out armatures.

Feed and Speed Change Mechanism

Feed and speed change mechanism have undergone further simplification. With the exception of a few light drilling machines and shapers, none of the tools displayed at the International Amphitheatre was equipped with the old standard cone pulley. The demands of modern production require all geared heads and positive drive. Also, in the newest lathes, thread cutting is reduced to an elemental operation requiring no special knowledge of change gears or other mechanism on the part of the operator. The range of feeds and speeds seems to be constantly increasing and there were exhibited a 36-inch turret lathe with nine speed changes, ranging from 14 to 285 revolutions per minute, and a 14-inch, high duty shaper with a range of cutting speeds of from 10 to 130 strokes per minute.

The development of the turret lathe into a manufacturing machine with a wide range of possibilities was vividly illustrated by the displays on the convention floor. Also the adaptation of the gang drill to a multitude of operations ordinarily performed on a chucking lathe was illustrated.

The displays of grinding machines demonstrated that the capacity of these tools at the present stage of their development is governed only by the limitations of abrasive materials. One of the most interesting machines of this class was a horizontal, gravity feed surface grinder for foundry use. The wheel was about 48 inches in diameter so equipped that castings with flat surfaces were held in contact by gravity without the use of chucks of any kind. All the workman has to do is to fit the castings to the machine, practically no skill being required.

Woodworking Machines

Woodworking machines came in for a large share of attention. It is evident that the builders of wood cutting tools have profited by the example of the builders of metal-working machines in striving for high speed, large capacity and practically automatic operation. One manufacturer exhibited a universal wood milling machine, which has practically as wide a range of operations as the latest standard metal milling machine. This tool is particularly useful in the pattern shop, where a large number of gear patterns are to be made. Another manufacturer exhibited a patternmaker's disc grinder, equipped with a 30-inch paper cemented steel disc wheel, and a 6-inch in diameter reciprocating sanding drum. The tool work tables of this machine are each adjustable in any direction, so that angular and irregularly-curved work may be shaped in minimum time. This machine performs practically all of the operations which the patternmaker ordinarily does by hand with the aid of a chisel, spokeshave and plane.

Molding Machines

The molding machine display was unusually large, both in the number of individual exhibits and diversity of machines shown. While the equipment embodied no radical departures in principle of operation, nevertheless numerous new combination machines were introduced. In the design of tools of this type, the tendency is toward the elimination of hand work entirely and the mechanical performance of every movement involved in making a mold. Three different types of electrically-operated jar-ramming machines were shown as compared with only one last year. The economy, ease of application and flexibility of

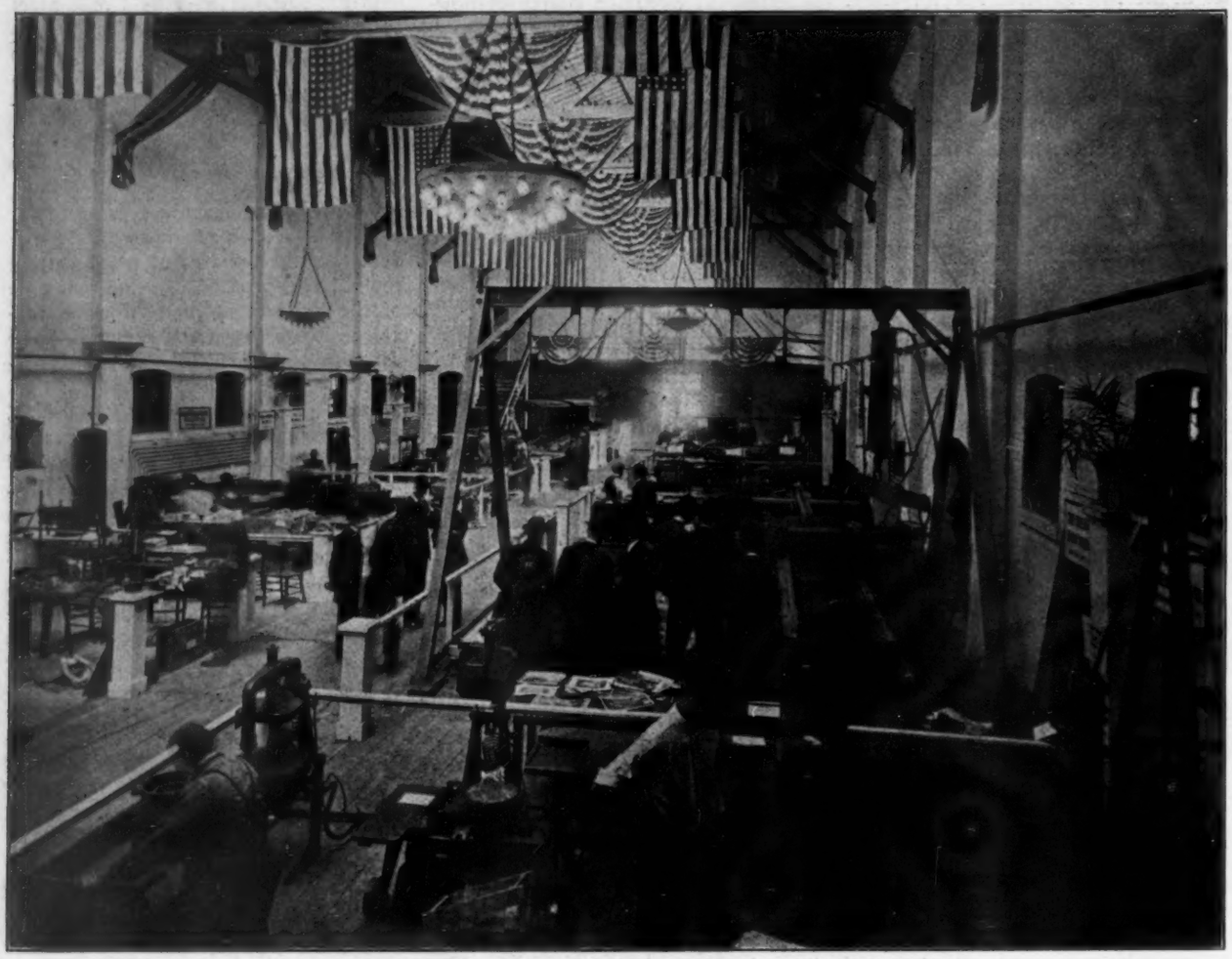
electric power are only beginning to be recognized by molding machine manufacturers and foundrymen generally, and its use in casting plants promises to be extended rapidly. Many of the molding machines in the exhibition were improved, if not redesigned since the Buffalo show last year, and this reflects the wonderful enterprise of builders of this class of machinery and their desire to meet every requirement of the casting manufacturer.

An exceedingly ingenious combination machine was exhibited by the Midland Machine Co., Detroit. Operated by compressed air, it rammed the mold by jarring, clamped it automatically by two arms and rolled it over in position for drawing the pattern. The jar-ramming table then was elevated by the piston of the jar-ramming cylinder until it came in contact with the bottom board of the mold, the vibrator set in motion and the mold was lowered away from the pattern on the table of the jar-ramming mechanism. After lifting off the mold, the roll-over mechanism was rolled back into its original position, the pattern plate was lowered onto the jar-ramming table and a flask was set in position for making another mold. One feature of the machine that proved interesting to the visiting foundrymen was the provision for drawing the pattern at any desired speed. All of the operations are controlled by three levers and are performed by a double-acting cylinder.

Simple Jolt, Roll-Over

Another combination machine, exceedingly simple in design and construction, was shown by the Federal Foundry Supply Co., Cleveland. This was of the jolt- roll-over and direct-draw type. The roll-over device to which the pattern or core box is bolted, was hinged to the jolt-ramming table and after making the mold it was rolled-over by hand. After levelling the bottom board, the pattern was drawn by raising the jar-ramming piston, which elevated the table to which the roll-over device was hinged. By withdrawing the hinge pin of the roll-over mechanism, the latter can be detached from the machine and the device can be converted into a plain jar-rammer. Other machines exhibited included several types of plain jar-rammers for making molds and cores.

A total of 19 machines was included in the exhibit made by the Osborn Mfg. Co., Cleveland. Several new types were shown, a 54-inch jolt-ramming, direct-draw roll-over machine, having attracted considerable attention. Two other sizes of this type, namely 22 and 30-inch, also were displayed, which demonstrated both the roll-over and stripping plate principles of operation. A hand roll-over machine, ingeniously equipped with match-plates for making molds for a heater fire pot, shaker grate and a stove top shelf, eliminated several operations heretofore separately performed and effected great economies in molding costs. Among the other new machines were included a small foot-power-jar, direct-draw and roll-over machine and a portable pneumatic squeezer, equipped with ball bearing wheels, described in the October issue of *The Foundry*. A device which will save considerable time in the operation of jar-ramming, roll-over molding machines, also displayed by the Osborn company, consisted of a pneumatic lock for clamping bottom



A SECTION OF THE MOLDING MACHINE EXHIBIT

boards to the table of machines of this type.

Since the Buffalo show, the jar-ramming, roll-over, squeezer and pattern-drawing machines, built by the A. Buch's Sons Co., Elizabethtown, Pa., were greatly improved and two types were displayed, for either hand or power operation. In addition, the line of aluminum snap flasks made by this company were exhibited, as well as cast iron jackets. The gravity molding machine, built by the Buch's company, was not exhibited, although it has been practically remodeled and greatly improved during the year.

extensive line of molding machines built by Henry E. Pridmore, which were shown totalled 20 models.

A feature of the exhibit made by the Arcade Mfg. Co., Freeport, Ill., was a pyramid of ten Norcross jar-ramming machines, which had a combined jolting capacity of 291,000 pounds and a total weight of 121,590 pounds. The base of the pyramid consisted of a large three-cylinder machine, equipped with a 7 x 14-foot table and with a capacity for ramming molds weighing 90,000 pounds. The next machine was of the two-cylinder type, with a table 6 x 10 feet and a jolting capacity

was shown.

Plain and combination, electrically-operated molding machines were among the new types introduced by the International Molding Machine Co., Chicago. The combination machine was of the jar-ramming turn-over-draw type with a capacity for making half molds weighing 500 pounds. The motor for driving the machine had a capacity of only one horsepower. Another interesting machine was an air squeezer, equipped to ram copes and drags at different pressures.

Several new types of Dearseley molding machines were shown by the

THE MACHINE TOOL EXHIBIT, INTERNATIONAL AMPHITHEATER, CHICAGO

Two new combinations of electrically-driven jar-ramming molding machines, first introduced by Henry E. Pridmore, Chicago, last year, were displayed. These included an electrically-driven, jar-ramming, rock-over machine and an electrically-driven, jar-ramming stripping plate machine. On the stripping plate machine, a large tee pattern was mounted and an engine base was mounted on the electric-driven jar-ramming rock-over. New, plain 10-inch power squeezers and stripping plate power squeezers, also were exhibited. Types of the

of 43,000 pounds. The remainder of the pyramid, which had a height of 38 feet was built-up of single-cylinder machines in the followig order of their capacities: Twenty-five thousand pounds, 16,000 pounds, 18,000 pounds, 16,000 pounds, 4,000 pounds and 1,500 pounds. The top of the pyramid consisted of small jolt rammers of the single-cylinder type adapted to core-making. A Modern machine, built by the Arcade Mfg. Co., equipped for squeezing the mold, drawing the pattern and moving the mold forward for lifting-off, by compressed air, also

S. Freeman & Sons Mfg. Co., Racine Wis. One consisted of a hand-operated stripping plate molding machine. The roll-over mechanism is counterbalanced so as to facilitate this operation with the least amount of effort on the part of the operator. An interesting feature of this exhibit was a stripping plate machine, capable of handling four-part molds. The two cheek plates were attached to the machine and were arranged for stripping, while the cope and drag plates were hinged, having been swung forward into molding position after the

two cheeks were stripped. In addition, this machine made the green sand cores required for the mold demonstrated.

A sectional operating model of the jar-ramming machine, built by the Mumford Molding Machine Co., of which the Vulcan Engineering Sales Co., Chicago, is exclusive sales agent, attracted a large amount of attention. A 14-inch jolt-ramming machine was also shown, which was equipped with a 48 x 72-inch table and a pit pattern-draft device. Although one of the pioneer builders of pneumatic jar-ramming machines, the Mumford company now is manufacturing an electrically operated jarring machine, one size of which was shown in operation. Other novel machines included a hand-operated 3-inch jolt-rammer, equipped with a stripping plate mechanism and an 8 x 8-inch baby jolt-ramming core machine, with a lifting capacity of 90 pounds. This machine is hand-operated and is adapted to core shop use, particularly for rapidly ramming small cores.

Roller-Ramming Machine

The roller-ramming molding machine built by the Snead & Co. Iron Works, Jersey City, N. J., which was shown in operation, was equipped with a pattern for a gray iron book case casting, 7 feet 6 inches long and 25½ inches wide. In the operation of this machine, a cast iron roller is employed for ramming the sand. After sand has been riddled over the pattern, the flask is filled by a sand dumping box, which is moved into position above the machine by an air hoist, operating on an I-beam spanning the machine. After the roller has passed over the sand several times, the sand is struck-off by hand, the pattern is lowered away from the mold, which is lifted off by the same hoist that conveys the dumping box to the machine. Other patterns used for demonstrating purposes included plates containing eight radiators and three pieces of stove plate, including a stove top, stove side and stove door. One of these machines, recently installed, is used for molding textile machinery castings, 15 feet long and 30 inches wide. The roller is operated by a three-horsepower motor.

Several new combination machines were exhibited by the Herman Pneumatic Machine Co., Zelienople, Pa. The jar-ramming, independent roll-over and independent pattern drawing machines proved a novelty, inasmuch as each operation is performed by a separate air cylinder. For light work a jar-ramming, squeezing and hand-stripping plate machine was introduced. Another new machine for making molds and cores was of the jar-ramming, hand draw type, equipped with a combination roll-over and stripping plate device.

A new power squeezer was displayed by the Berkshire Mfg. Co., Cleveland, the squeezer head being adjusted by a screw. A combination air squeezer for either hand or power operation and a core machine, the latter have been practically redesigned, also were shown.

Among the new machines shown by the Davenport Machine & Foundry Co., Davenport, Ia., was a power squeezer and other types included portable and stationary jolt rock-over machines, plain jolt machines and hand-ramming, roll-over machines.

Sand-Handling Machinery

Although the exhibits of sand-handling machinery contained nothing revolutionary in design, numerous minor improvements and refinements were embodied in the apparatus displayed. In the construction of batch mixers, rotary sifters and vibrating riddles of various types, there is a pronounced tendency to use heavier materials and more rugged fastenings in order to avoid breakdowns and insure long life under severe operating conditions. Some manufacturers are substituting steel castings for gray iron wherever possible. Several types of single line grab buckets designed primarily for handling sand and cleaning up floors in steel foundries were exhibited. There has been no change in the essential features of these buckets since they were first introduced three years ago; the improvements embodied in the latest buckets include refinements in details, the employment of heavier plates and steel castings and changes in the shape of the bucket which permit it to work up into corners and prevent sand from sticking to the inside of the shell when open. One manufacturer showed a motor-driven-self-propelled sand cutting and mixing machine of novel design.

Among the exhibitors of sand-handling machinery were the Arcade Mfg. Co., Freeport, Ill.; Battle Creek Sand Sifter Co., Battle Creek, Mich.; Blystone Machinery Co., Cambridge Springs, Pa.; Chicago Pneumatic Tool Co., Chicago; Duplex Shaker Works, Chicago; Great Western Mfg. Co., Leavenworth, Kas.; J. S. McCormick Co., Pittsburgh; William Sellers & Co., Philadelphia; Standard Sand & Machine Co., Cleveland; Sand Mixing Machine Co., New York; The Hayward Co., New York, and Pawling & Harnischfeger Co., Milwaukee.

The economies possible through the use of aluminum match-plates were amply demonstrated during the show. One exhibit included match-plates in various stages of manufacture and a complete kitchen range cast from match-plates illustrating the thin sections and clean-cut castings made possible by the employment of this method of molding. Another exhibitor had the plates fitted to molding machines and demonstrated them in actual use, while a third displayed a special non-shrinking white match-plate composition.

The exhibitors of match-plates included the Goodale Co., Kalamazoo, Mich., the Arcade Mfg. Co., Freeport, Ill., and the Federal Foundry Supply Co., Cleveland.

With the manufacturers of pneumatic tools striving to reduce the air consumption of their devices and the builders of compressors constantly working toward increased efficiency, the advantages of compressed air are daily becoming more apparent to the foundryman. The exhibition included liberal displays of pneumatic hammers, rammers, drills, etc., air hoists, trolleys and cranes together with compressors of all kinds. During the past year special attention has been given to the development of small compressors that will operate efficiently, and sufficient progress has been made so that now even the smallest foundry need not forego the conveniences of compressed air.

Among the exhibitors of pneumatic machinery were the Chicago Pneumatic Tool Co., Chicago; Cleveland Pneumatic Tool Co., Cleveland; Curtis Pneumatic Machinery Co., St. Louis; Independent Pneumatic Tool Co., Chicago; Ingersoll-Rand Co., New York; Sullivan Machinery Co., Chicago; Gardner Governor Co., Quincy, Ill., and the American Steam Pump Co., Battle Creek, Mich.

Sand Blasting

The growing importance of sand blasting as an economical method of cleaning castings was demonstrated by eight large working exhibits. Economy in the use of compressed air is receiving increasing attention on the part of the builders of sand blast apparatus, and the latest machines with improved nozzles use only about half the air required for the earlier devices; special attention is also being given to apparatus for reclaiming the used sand. In the larger machines this is usually accomplished by providing a hopper under the work grating into which the sand falls and from which it is transferred to the supply hopper by a bucket elevator. In the past year the

development of semi-automatic sand blast machines has gone forward apace; these include sand-blast barrels with fixed and oscillating nozzles, continuous machines in which the work is placed on a moving platform or a rotating table. In some machines chilled steel shot is used in place of sand.

The Hoevel Sandblast Machine Co., New York, exhibited a continuous machine provided with a horizontal rotating table. This machine is especially suited to foundries turning out a large number of light castings. The New Haven Sand Blast Co., New Haven, Conn., displayed a self-contained sand blast barrel; in this device the sand mixer is contained in the barrel and there is no rubber sand hose. A high pressure machine using 69 cubic feet of free air per minute at 80 pounds pressure was exhibited by the Carter Metals Cleaning Co., Philadelphia. The Mott Sand Blast Mfg. Co., affiliated with the De La Vergne Machine Co., New York, exhibited a sand blast barrel with an oscillating nozzle and also displayed an all-steel sand blast room with special dust collecting facilities. The Pangborn Corporation, Hagerstown, Md., displayed a hose type, semi-automatic sand blast machine and a double nozzle sand blast barrel provided with special devices to economize air. The W. W. Sly Mfg. Co., Cleveland, showed an automatic machine which includes a sand blast barrel, sand sifter, elevator and storage hopper. Other standard sand blasting equipment was exhibited by the J. W. Paxson Co., Philadelphia, and the Macleod Co., Cincinnati. W. F. Stodder, Syracuse, N. Y., displayed a sand blast nozzle for cleaning operations which can be operated without a special tank for the sand.

Oxy-Acetylene Welding

In the three exhibits of oxy-acetylene welding apparatus the standard types of generating machinery, torches, tables and auxiliary paraphernalia were displayed. Demonstrations of welding and cutting were given throughout the week. One manufacturer has developed a light torch specially designed for soldering and brazing; another has developed a pantograph device for accurate cutting with the oxy-acetylene torch. The exhibitors of welding devices included the Oxweld Acetylene Co., Chicago; the Prest-o-Lite Co., Indianapolis, and the Davis-Bournonville Co., New York.

More than 200 samples of pig iron of varying analyses were displayed by Rogers, Brown & Co., Cincinnati. This comprised one of the most complete lines of samples of this kind ever collected. In addition, a pig of iron weighing 107 pounds was shown and in containers were displayed the varying amounts of iron ore, coke and limestone required to smelt this amount of iron. A handsome display of by-product coke in the form of a replica of the Rock of Gibraltar was made jointly by Baird & West, Detroit, and Pickands, Brown & Co., Chicago. Samples of Mayari pig were displayed by the Pennsylvania Steel Co., Philadelphia.

The Carborundum Co., Niagara Falls, N. Y., and the Norton Co., Worcester, Mass., displayed an extensive line of refractory materials. Grinding machines were shown by E. O. Partridge, Chicago, and the Norton company.

Pattern Shop Equipment

In various exhibits was contained practically the entire equipment for pattern shop operations. The display of the Oliver Machinery Co., Grand Rapids, Mich., was unusually complete and included several new woodworking tools. Charles H. Besly & Co., Chicago, and the Gardner Machine Co., Beloit, Wis., exhibited disc grinders, and pattern shop saws were shown by E. C. Atkins & Co., Indianapolis. The pattern lumber exhibit of the Thomas E. Coale Lumber Co., Philadelphia, proved a novelty and attracted much attention. Various grades of lumber were displayed and many woods adapted to pattern shop use, were shown.

For the transportation of material in foundries and other industrial plants various types of trucks were shown by the Automatic Transportation Co., Buffalo, and the Cowan Truck Co., Holyoke, Mass. Automobile trucks were exhibited by the Mercury Truck Co., Chicago.

The line of non-ferrous melting furnaces exhibited by the Monarch Engineering & Mfg. Co., Baltimore, reflected great advances in the art during the last twelve months. One furnace of the portable type can be moved along the floor to pour-off the molds and various tilting stationary furnaces also were shown. Crucibles and other graphite products weer displayed by the Joseph Dixon Crucible Co., Jersey City, N. J., and the Jonathon Bartley Crucible Co., Trenton, N. J., while the Gill Clay Pot Co., Muncie, Ind., had an extensive line of brass furnace liners, covers, base blocks and other fire clay products. Magnetic separators for brass foundry use were shown by the Dings Electro-Magnetic Separator Co., Milwaukee. Equipment for the plating department, including dynamos, motor-generator sets, mechanical plating barrel, etc., was contained in the exhibit of the Bennett-O'Connell Co., Chicago.

That the testing of cores and core-sand mixtures now is being more widely practiced in foundries than in recent years was reflected by the testing equipment for this work displayed by the Wadsworth Core Machine & Equipment Co., Akron, O. For mixing the sand for laboratory purposes a small pan mill is employed and small briquettes are made from the mixtures to be tested which are baked in a small, gasoline-fired oven. The briquettes next are tested to ascertain their breaking strength, and the results obtained not only will serve as a check on the mixtures used from day to day, but on the quality of the sands, oils and compounds purchased. For average core work, briquettes will develop a tensile strength of 80 to 100 pounds per square inch, although some brass and aluminum cores will break at 30 to 40 pounds. An improved core-jarring machine also was exhibited as well as two machines for making stock cores, etc. The Brown Specialty Machinery Co., Chicago, had a complete line of Hammer core machines, complete with dies and core tapering and cutting-off machines. The Berkshire Mfg. Co., Cleveland, exhibited its redesigned Berkshire-Acme core machine.

The extensive line of goggles exhibited by the Julius King Optical Co., Chicago, and T. A. Willson & Co., Reading, Pa., reflected the widespread adoption of eye protectors to safeguard the sight of industrial workers. Several new types of goggles were shown which embodied distinct improvement over existing types.

Foundry Equipment

The foundry equipment exhibits were unusually complete and included displays of tumbling barrels by the W. W. Sly Mfg. Co., Cleveland; Whiting Foundry Equipment Co., Harvey, Ill.; S. Obermayer Co., Chicago, and the Calumet Foundry Equipment Co., Harvey Ill.; blast meters for cupolas, Chas. J. Clark, Chicago; steel shop furniture, including barrels, boxes, pattern racks, etc., Cleveland Wire Spring Co., Cleveland; motor and turbine-driven air compressors, General Electric Co., Schenectady, N. Y.; core ovens, Quigley Furnace Co., Springfield, Mass., Monarch Engineer-

ing & Mfg. Co., Baltimore, and Whiting Foundry Equipment Co., Harvey, Ill.; casting machines equipped with permanent molds, Quitman Foundry & Machine Co., Quitman, Ga.; automatic plate and pipe polishing machines, the W. W. Robinson Co., Owosso, Mich.; cranes and hoists, Vulcan Engineering Sales Co., Chicago, Whiting Foundry Equipment Co., Harvey, Ill., Wright Mfg. Co., Lisbon, O., and the Shepard Electric Crane & Hoist Co., Montour Falls, N. Y.; steel flasks, jackets, etc., Sterling Wheelbarrow Co., Milwaukee; electrical equipment for foundries, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.; wire guards for lighting fixtures, sockets, clusters and other lighting specialties, Benjamin Electric Mfg. Co., Chicago; pumps, American Steam Pump Co., Battle Creek, Mich., and dust collectors, the Knickerbocker Co., Jackson, Mich.

Molding and Core Sands

Molding and core sands were exhibited by the following: Albany Sand & Supply Co., Albany, N. Y.; Garden City Sand Co., Chicago; Interstate Sand Co., Zanesville, O.; Ohio Sand Co., Conneaut, O., and the Superior Sand Co., Cleveland.

Ingot brass mixtures and brass foundry metals were displayed by the following: Ajax Metal Co., Philadelphia; S. Birkenstein & Sons, Chicago, and the Great Western Smelting & Refining Co., Chicago; alloys, Goldschmidt Thermit Co., New York, and the Titanium Alloy Mfg. Co., Niagara Falls, N. Y.

The following exhibits of core oils and core compounds were made: Cataract Refining & Mfg. Co., Buffalo; Crawford Oil & Chemical Co., Cleveland; Holland Core Oil Co., Chicago, and the Peterson-National Co., Chicago.

Steel sash and steel partitions, Pond continuous sash and sash-operating devices and the Pond truss for foundries and forge shops were displayed by the David Lupton's Sons Co., Philadelphia.

A great variety of semi-steel castings, including automobile cylinders, gears, piston rings, etc., made with mixtures containing from 10 to 50 per cent steel were shown by McLain's System, Milwaukee.

Foundry Supplies

Exhibits of foundry supplies were made by the following: Hill & Griffith Co., Cincinnati; S. Obermayer Co., Chicago; T. P. Kelly & Co., New York; Osborn Mfg. Co., Cleveland; J. W. Paxson Co., Philadelphia; Buckeye Products Co., Cincinnati; Stanley Doggett, New York; J. S. McCormick Co., Pittsburgh; Peerless Parting Co., Ottawa, Ill.; Robeson Process Co., Pennington, N. J.; Silica Products Co., Chicago; Frederic B. Stevens, Detroit; United States Graphite Co., Saginaw, Mich.; Wyoming Shovel Co., Wyoming, Pa., and the E. J. Woodison Co., Detroit.

Shop Flooring

Creosoted wood blocks for factory flooring purposes were exhibited by the Ayer & Lord Tie Co., Chicago, and the Jennison & Wright Co., Toledo.

Furnaces

Furnaces for melting brass and nonferrous metals were shown by the Hawley-Down Draft Furnace Co., Easton, Pa.; Monarch Engineering & Mfg. Co., Baltimore; Whiting Foundry Equipment Co., Harvey, Ill., and the Ideal Furnace Co., Chester, Pa. Electric furnaces were displayed by the Hoskins Mfg. Co., Detroit, and the Whiting company exhibited a 4,000-pound steel converter.

EASTERN FOUNDRYMEN

Resume Activities After Summer Vacation—Several Meetings.

Various eastern foundrymen's associations have again actively taken up their fall and winter work. Opening meetings have been generally held by these organizations after the regular suspension of activities during the summer months.

The New England Foundrymen's Association held its open meeting at the Exchange Club, Boston, Wednesday evening, Oct. 8. Charles F. Dietz, of the Norton Co., Worcester, Mass., presented an illustrated address on "Grinding Conditions in the Foundry." Dinner was served following the meeting.

The Newark, N. J., Foundrymen's Association met at the Washington restaurant, Wednesday evening, Oct. 8, and after partaking of dinner, the members listened to an address on "The Problem of Local Transportation" by R. T. Hodgkins, manager of the Studebaker Bros., New York City. The speaker discussed the advantages and disadvantages of the various types of vehicles and electric and gasoline trucks. C. K. Thomas, manager of the Federal Truck Co., New York City, spoke upon the advantages of the gasoline automobile truck.

The Philadelphia Foundrymen's Association opened its meetings at the Hotel Walton, Oct. 1.

FAIR SHOWING

Made by Steel Corporation Tonnage For September—Loss Moderate.

A loss of 219,683 tons in the order books of the United States Steel Corporation, took place during the month of September, according to the monthly report of unfilled tonnage as of Sept. 30, which was issued Oct. 10. This compares with a reduction of 175,888 tons in August and 407,965 tons in July. The statement is regarded as a fairly good one under the conditions of trading, inasmuch as the decrease is only slightly larger than in August, which made the most favorable showing of any month since February. The tonnage of orders on hand Sept. 30 is reported as 5,003,785 tons. This is a decline of 1,547,722 tons from Sept. 30, 1912, but is 1,392,468 tons greater than Sept. 30, 1911.

Date.		Total.	Change, tonnage.	Change, per cent.
Sep. 30,	1913....	5,003,785	219,683—	4.24—
Aug. 31,	1913....	5,223,468	175,888—	3.03—
July 31,	1913....	5,399,356	407,965—	7.03—
June 30,	1913....	5,807,317	517,005—	8.18—
May 31,	1913....	6,324,322	654,440—	9.38—
Apr. 30,	1913....	6,978,762	490,194—	6.55—
Mar. 31,	1913....	7,468,956	187,758—	2.45—
Feb. 28,	1913....	7,656,714	170,654—	2.18—
Jan. 31,	1913....	7,827,368	104,796—	1.32—
Dec. 31,	1912....	7,932,164	79,281+	1.01+
Nov. 30,	1912....	7,852,883	258,502+	3.40+
Oct. 31,	1912....	7,594,381	1,042,874+	15.33+
Sep. 30,	1912....	6,551,507	388,132+	6.29+
Aug. 31,	1912....	6,163,375	206,296+	3.46+
July 31,	1912....	5,957,079	149,773+	2.58+
June 30,	1912....	5,807,346	56,363+	0.98+
May 31,	1912....	5,750,983	86,983+	1.52+
Apr. 30,	1912....	5,664,885	360,044+	6.97+
Mar. 31,	1912....	5,304,841	149,359—	2.79—
Feb. 29,	1912....	5,454,200	74,479+	1.38+
Jan. 31,	1912....	5,379,721	294,960+	5.71+
Dec. 31,	1911....	5,084,761	942,806+	23.24+
Nov. 30,	1911....	4,141,955	447,627+	12.06+
Oct. 31,	1911....	3,694,328	83,011+	2.25+
Sep. 30,	1911....	3,611,317	84,668—	2.34—
Aug. 31,	1911....	3,695,985	111,900+	3.33+
July 31,	1911....	3,584,085	223,027+	7.16+
June 30,	1911....	3,361,058	247,871+	7.96+
May 31,	1911....	3,113,187	105,617—	3.28—
Apr. 30,	1911....	3,218,704	228,597—	6.63—
Mar. 31,	1911....	3,447,301	46,758+	1.37+
Feb. 28,	1911....	3,400,543	289,624+	9.31+
Jan. 31,	1911....	3,110,919	436,163+	16.30+
Dec. 31,	1910....	2,674,757	85,656—	3.09—
Nov. 30,	1910....	2,760,413	111,536—	3.88—
Oct. 31,	1910....	2,871,949	286,157—	9.12—
Sep. 30,	1910....	3,159,106	379,088—	10.74—
Aug. 31,	1910....	3,537,128	433,803—	10.92—
July 31,	1910....	3,910,931	286,863—	6.72—

Employes Protest.—Three hundred and sixty employes in the general offices of the American Sheet & Tin Plate Co., Frick building, through Congressman James Francis Burke, have filed a petition with the attorney general protesting against the threatened dissolution of the United States Steel Corporation. More than 1,000 mill workers and employes of the company in the plant at New Castle, Pa., have signed similar petitions.

Contracts are being let by the Orten Steinbrenner Steel Co., Huntington, Ind., for an extension to increase capacity about 50 per cent. Steam shovels are the output. The addition is about 80 x 80 feet.

Witnesses Tell of Great Iron Ore Reserves

Many Millions in the Adirondack Region—Extensive Deposits in Cuba—Testimony in the Steel Corporation Dissolution Suit Continued

The questioning of witnesses for the defense in the government's suit against the United States Steel Corporation has so far been devoted to the iron ore reserves of that Corporation. In order to refute the government's allegation that the Corporation enjoys a monopoly of the commercially available ore in this country, counsel for the defense has put upon the stand a large number of the leading geologists and iron ore experts. In general, the conclusion drawn from the testimony of these witnesses was that plenty of high grade ore is available for anyone who wants it.

In addition to the witnesses named in the preceding issue of THE IRON TRADE REVIEW, *the following testified last week: Frank Nason, consulting geologist, of West Haven, Conn.; Charles Austin Buck and H. S. Snyder, vice presidents of the Bethlehem Steel Co.; Edwin C. Ellis, geologist of the Tennessee Coal, Iron & Railroad Co.; Rukard Hurd, secretary of the Minnesota tax commission; Edwin C. Eckel, mining geologist, of Washington, D. C.; Charles F. Rand, president of the Spanish-American Iron Co.; Frederick W. Wood, president of the Maryland Steel Co.*

The witnesses so far, with two exceptions, have been questioned by David A. Reed, for the defense, and Judge Jacob M. Dickinson, for the government. These two at present are doing the greater part of the work. It is expected that other members of counsel for the defense will conduct the examinations of witnesses when other phases of the case are taken up later.

Frank Nason, a consulting geologist, of West Haven, Conn., resumed the stand last Wednesday. He told about special exploratory work he conducted in a number of mines in New York and New Jersey, and said he is familiar with the quality and tonnage of the ore in all the other mines in these two states. In fact, he has examined all of them personally, with an exception here and there. As a result, he said, he is certain that the ore reserves of these two states are approximately as follows: In the Adirondack region, 800,000,000 tons of natural ore, or 350,000,000 tons of concentrated ore; in southeast New York, about 35,000,000 tons of concentrates; in New Jersey, roughly 70,000,000 tons of concentrates.

The output of New Jersey mines, he said, averaged 250,000 tons annually, for the past 20 years, and in some years the output has been as high as 600,000. This ore has been produced by the Thomas Iron Co., the Empire Iron & Steel Co., the Wharton Steel Co. and the Ringwood Iron Co., he said. The ore produced in New Jersey, he said, seldom runs below 52 per cent in iron content. Mr. Nason couldn't tell accurately what the production was in southeastern New York. The ore in Dutchess, Orange and Putnam counties, he said, is of good quality, and is mostly magnetite. In the Lake Champlain section, Witherbee, Sherman & Co. produce about 600,000 tons of high grade ore a year.

Mr. Nason was put through a severe cross-examination by Judge Dickinson. The government attorney endeavored to prove Mr. Nason's unfamiliarity with the iron-bearing districts he had mentioned but with no success, as the witness was able to substantiate all of his statements. Asked in what capacity he was testifying in this case, Mr. Nason stated that he had simply come in obedience to a subpoena. He denied that the Steel Corporation had made any agreements with him or offered to pay him for his testimony. He admitted to Judge Dickinson that he was a shareholder in the United States Steel Corporation, but said that the extent of his holdings was 100 shares of preferred stock, which he has bought from time to time as an investment. At the conclusion of Mr. Nason's cross-examination, David A. Reed, of counsel for the defense, read a statement into the record to the effect that the Steel Corporation, while it had not made any agreement with Mr. Nason in respect to payment for his testimony, did not propose to take him away from his work without paying him for his time, and that Mr. Nason would be paid the same as other experts who have testified in this case.

Charles Austin Buck, of South Bethlehem, Pa., was next called to the stand. He said that he is a steel manufacturer and a chemist and metallurgist by profession. He has been with the Bethlehem Iron Co., and later with the Bethlehem Steel Co., since he left college 26 years ago. During that time he has served as chemist, superintendent of blast furnaces and in other capacities and now is vice president of the Bethlehem Steel Co. He described the ore reserves of the Bethlehem Steel Co. and gave the extent of the ore controlled by that company.

On the north coast of Cuba, said Mr. Buck, the Bethlehem Steel Co. owns about 200,000,000 tons of high grade ore, and on the south coast about 4,000,000 to 5,000,000 tons. At present it is not working the north coast deposits but is using about 400,000 tons yearly of the south coast ore. The Bethlehem Steel Co. uses 400,000 tons of magnetite every year, which is brought from Sweden. This ore is produced at the Kirrunawara and averages 66 to 67 per cent in iron content. It is furnished under the terms of a long-time contract which guarantees that all the ore furnished will be better than 65 per cent in iron content. The Bethlehem company has no lake ores, but buys about 100,000 tons of lake ore in the open market every year. It also uses considerable ore from New York state, getting a portion of it from its own Cheever mine in the Adirondack district and the remainder from Witherbee, Sherman & Co.

Mr. Buck then described the reserves of the Bethlehem Steel Co. in Chili, which have been acquired within the past year. This ore is located near Coquimbo, on a mountain about four miles from the seacoast. The deposit has not been thoroughly explored, but is known to contain at least 500,000,000 tons. The ore averages 69 per cent in iron content and below 0.03 per cent in phosphorus content. The character of the deposit is such that no stripping will be required and the working will resemble an open quarry. The company is now installing equipment to extract about 1,500,000 tons of this ore per year. It is now preparing to let contracts for vessels. The ore will be brought either to New York or Philadelphia by way of the Panama canal.

Mr. Buck stated that the Bethlehem company has been offered a number of other ore properties, but has declined to purchase them because it considered its present ore reserves sufficient to last for many years.

He said that the Bethlehem company since its formation has always depended on foreign ores, these always having been the most econom-

ical for it to use. He said that the Bethlehem company has six blast furnaces, and that its total ore requirements per year are about 1,250,000 tons. He said that the Chilean ore can be brought to South Bethlehem with great economy as compared with the cost of lake ore. He said, also, that the Chilean ore can be mined at much less expense than the average lake ores.

In cross examination by Judge Dickinson, the witness stated that the Bethlehem Steel Co., the Midvale Steel Co. and the Carnegie Steel Co. are the only manufacturers of armor plate in this country. The Bethlehem and the Midvale, he said, are the only manufacturers of large gun forgings. He admitted that the gun forgings and armor plate produced by the Bethlehem Steel Co., considering their value, and not their tonnage, formed a large part of the Bethlehem Steel Co.'s business. For the manufacture of armor plate, he said, special ore is required and this is obtained from the Cranberry deposits in North Carolina and the Chateaugay deposits in southeastern New York. Questioned regarding the competitors of the Bethlehem Steel Co. in the production of merchant steel products, Mr. Buck stated that the Bethlehem company has a great deal of competition in all of the products which it makes.

H. S. Snyder, vice president of the Bethlehem Steel Co., was next called to the stand. He told about the ore deposits of the north coast of Cuba. This ore, he said, has an iron content of about 50 per cent when dried. It has a percentage of nickel which makes it desirable for steel production. The holdings of the Bethlehem Steel Co. on the north coast, of ore in the ground, total about 770,000,000 tons; the Pennsylvania Steel Co. about 1,400,000 tons; the Buena Vista Iron Co. about 300,000,000 tons; the Guantanaimo Exploration Co. about 210,000,000 tons; the Eastern Steel Co. about 50,000,000 tons; the United States Steel Corporation about 200,000,000 tons; while other scattered holdings amount to about 300,000,000 tons. Mr. Snyder also testified about the Chilean ore holdings of the Bethlehem Steel Co., and his testimony in this connection coincided with that of Mr. Buck. Mr. Snyder intimated in his testimony that Cuban and other foreign ores are used in this country only by the steel companies which are located on or near the seaboard.

Edward S. Hughes, of Abilene, Tex., was next called to the stand. He is the head of Ed. S. Hughes Co., of Abilene, which sells hardware. In addition, he is president of a bank, interested in a steamship company, is general manager of a small railroad in Texas, and is part owner in a real estate business. Richard V. Lindabury, of counsel for the defense, conducted his direct examination. Mr. Hughes testified that the Ed. S. Hughes Co. deals in wire nails, sheets, corrugated iron, wire fencing and other steel products. He buys most of his nails and fencing from the American Steel & Wire Co., and his tin plate from the American Sheet & Tin Plate Co. He says that the American Steel & Wire Co. has achieved a dominancy in the Texas district partly because of the large line it carries, and partly because of the warehouse it established there in 1907, since it is thus able to give prompt delivery on orders. He said there is a great deal of competition in the Texas field in the sale of wire and other steel products by such companies as the American Steel & Wire Co., the Colorado Fuel & Iron Co., the Pittsburgh Steel Co., the Wheeling Corrugating Co., and others. He has never heard of any agreement as to prices or division of territory by these interests. In his dealings with the Corporation subsidiaries he has always enjoyed fair prices and fair treatment, and as far as he knows, the Corporation's competition with its competitors was and is fair.

Edwin E. Ellis, geologist of the Tennessee Coal, Iron & Railroad Co., resumed the stand on Thursday morning. He was cross examined by Judge Dickinson, of government counsel. Mr. Ellis was called to the stand Wednesday to submit for entry into the record a map of the Birmingham, Ala., district which was prepared by him. This map indicated the ore deposits in the Birmingham district, their quality and extent, and by whom they were controlled or operated. A great deal of time was devoted to explanation of the various features of the map, such as the shading of certain portions, the location of the boundaries of the different forties, etc.

The next witness was Rukard Hurd, Minneapolis, Minn., secretary of the Minnesota tax commission. He identified a copy of the commission's report for 1912 and told how the statistics therein set forth had been originally compiled. He testified regarding the tonnage of ore controlled by the Steel Corporation in Minnesota. If the Great Northern ores, known as "the Hill ores", were included in the Corporation's holdings, he said, the Corporation would have control of 78.55 per cent of the ores in Minnesota. Government counsel tried to get Mr. Hurd to state that the Hill ores are still in the control of the Steel Corporation even though the latter has given notice of the surrender of its lease. Steel Corporation counsel, on the other hand, declared that this ore should not be included in the reserves of the Steel Corporation. In this controversy Mr. Hurd refused to take part, saying:

"Here are the figures and they are right. But as to who controls the Great Northern ores, that is a question for you lawyers to decide."

Edwin C. Eckel, of Washington, D. C., was next called to the stand. He said that since 1895 he has been a geologist. First he was assistant geologist of New York state. In 1901, he became connected with the United States geological survey and continued thus until 1906, having charge of statistics on iron ore, manganese and aluminum ore. During this period he was the author of reports on the iron ores of Virginia, Georgia, Texas, Alabama and New York state. Since 1906, Mr. Eckel has acted as a consulting geologist for various ore and steel companies, having resigned from the survey in that year.

Charles F. Rand, president of the Spanish American Iron Co., and the Buena Vista Iron Co., who was next called, produced a table showing his estimates of the iron ore deposits in Cuba. According to this table, the total amount of commercially available ore there amounts to 3,221,000,000 tons. Of this the Spanish American Iron Co. controls 1,403,500,000 tons

In cross examination, Mr. Rand was asked to state the cost of mining and shipping Cuban ore. This he would not indicate in exact figures, but he said that the cost of nodulized ores from the north coast of Cuba, delivered at Baltimore, is less than 5 cents a unit. The analysis of dry Mayari ore for the first four months of 1913, he said, was 55.57 per cent iron; 4.41 silica; 14.21 alumina; 2.13 chromium; 1.04 nickel and cobalt; 0.022 phosphorus.

The next witness was Frederick W. Wood, of Baltimore, president of the Maryland Steel Co. He testified that the blast furnaces of his company were originally built for operating on foreign ore. The company is now using ore from both the north and south coasts of Cuba. In the future, after the south coast deposits have been exhausted, the Maryland company will operate on north coast ore exclusively. This ore, he said, because of the elements it contains, is admirable for steel making.

"We believe," he said, "that from this ore we produce the best rails which are made."

MEN OF THE IRON TRADE

E. W. MUDGE and R. B. Campbell, of the E. W. Mudge & Co., Pittsburgh, are enjoying a hunting trip in Canada.

JONATHAN R. JONES, vice president and treasurer of the Alan Wood Iron & Steel Co., Philadelphia, recently returned from a month's vacation.

BRIGHT SAGE was recently appointed general manager of the Bremen Mfg. Co., Bremen, O., maker of caloric engines, succeeding H. E. Young, deceased.

GEORGE S. McMURTY, New York, chairman board of directors of the American Sheet & Tin Plate Co., has returned from an extended trip through Europe.

A. C. DENMAN JR. was recently elected president and general manager of the California Industrial Co., Los Angeles, to succeed S. I. Merrill resigned.

T. H. GARTLAND, formerly foundry manager of the Interstate Foundry Co., Cleveland, was recently appointed general manager, succeeding F. A. Pope, resigned.

JAMES HARTNESS, president of the Jones & Lamson Machine Co., Springfield, Vt., was recently nominated president of the American Society of Mechanical Engineers.

THOMAS W. SELSER, formerly mechanical engineer with the Durango Sinaloa Mines Co., Los Angeles, has accepted a similar position with the Union Tool Co., Los Angeles.

A. J. STRONG, for the past six years Detroit office manager of the Pratt & Whitney Co., recently resigned to accept a position as sales manager for the Bock Bearing Co., Toledo, O.

SAMUEL S. WALES, chief electrician of the Ohio works of the Carnegie Steel Co., Youngstown, O., was recently appointed to represent the company abroad and left immediately for London.

THEODORE WACHS, formerly mechanical engineer with Sears, Roebuck & Co., Kankakee, Ill., was recently appointed manager of the plant No. 2 of the Chicago Pneumatic Tool Co., Franklin, Pa.

CHARLES W. ALLEN, well known in railroad circles, has been appointed manager of the railroad department of the Reading-Bayonne Steel Castings Co., with offices in Reading, Pa.

H. F. L. ORCUTT, formerly English agent for Ludwig Loewe & Co., and at present managing director of the Gear Grinding Co., Ltd., Birmingham, Eng., is at present in this country on a business tour.

W. H. GIBB, for the past five years connected with the Brown Instrument Co., Philadelphia, recently resigned to accept a position as general manager of sales for the Stupakoff laboratories, Pittsburgh.

WILLIAM P. ALDRICH, formerly associated with the United States Reclamation Service, recently accepted the chair of acting professor of mechanical and electrical engineering, University of Arizona, Tucson, Ariz.

O. G. SMITH, formerly connected with the Platt Iron Works, Dayton, O., was recently put in charge of the Chicago office of the machinery department of the Bethlehem Steel Co., with headquarters in the Peoples Gas building.

S. M. UDALE, formerly assistant research engineer with the Studebaker Corporation, is now in charge of the laboratory and motor-testing plant of Joseph Tracy, with New York offices in the United States Rubber building.

WILLIAM L. GARCIA, for the past eight years affiliated with the Fairbanks Co., as manager of the engineering and power transmission department, recently resigned to take a similar position with Flint & Chester, Inc., New York City, to take effect Oct. 6.

JAMES DUANE JR., for several years superintendent of the Midland plant of the Pittsburgh Crucible Steel Co., Pittsburgh, has been appointed superintendent of the Saucon furnaces of the Thomas Iron Co., Hellertown, Pa., and will assume charge immediately.

J. WARNER SHOOK, vice president and general manager of the Central Iron & Coal Co., Tuscaloosa, Ala., has resigned, effective Nov. 1, and will be succeeded by W. L. Kluttz, Birmingham, at present general superintendent of Thomas furnaces for the Republic Iron & Steel Co.

C. C. WHITTIER has been made treasurer and general manager of Robert W. Hunt & Co., Ltd., with headquarters at 905 McGill building, Montreal. He has been in charge of the company's business at Winnipeg. T. C. Irving Jr. has been re-elected vice president and will remain in charge at Toronto.

R. N. DICKMAN, mining engineer, has become associated with Robert W. Hunt & Co., Ltd., in the United States, and Robert W. Hunt & Co., Ltd., in Canada, having headquarters at 2280 Insurance building, Chicago. He is engaged now in the examination of gypsum and coal properties in western Canada.

E. H. GARY, chairman of the United States Steel Corporation, has agreed to act as one of the jury of awards which will judge the various exhibits at the International Exposition of Safety and Hygiene, which will open at the Grand Central Palace, New York City, Dec. 11. Judge Gary will give attention to the work shown by the iron and steel companies. Among the other judges will be Dr. H. Finley, commissioner of Education of New York state; Joseph J. Johnston, fire commission of New York City, and President McCall, of the National Electric Light Association.

DANIEL G. REID, director of the United States Steel Corporation, returned to New York, Oct. 9, after a three months' absence in Europe. Mr. Reid is quoted as saying that he did not believe that the tariff bill would hurt American business and industries. He thought that the country was prepared for it.

C. A. ROBERTS, formerly with the National Transit Co., at Oil City, Pa., and later president of the Bellefontaine Engine Co., Bellefontaine, Pa., now is connected with the Blaisdell Machinery Co., Bradford, Pa., manufacturer of vacuum cleaner apparatus, air and gas compressors, etc. The company has completed plans to manufacture gas engines designed almost exclusively for air and gas pumping.

GEORGE L. CLAYPOOL, assistant general manager of sales of the Republic Iron & Steel Co., Youngstown, O., and one of the best known men in the iron and steel trade, has resigned, to accept a position with Banning, Cooper & Co., Ltd., 1407 Oliver building, Pittsburgh. He will become associated with that firm Oct. 16. Mr. Claypool is one of the "old guard" of the Republic company, from a standpoint of service, having been identified with it since its formation in 1899. Previous to that time, he had been in the operating department of the Mahoning Valley Iron Co., which was absorbed by the Republic. Upon the organization of the new concern, Mr. Claypool became superintendent of the Andrews Bros. mill, which was later dismantled. In 1902, he joined the sales department, being assigned a position in the Cleveland office. A short time later, he was appointed manager of sales in the Pittsburgh district, where he has remained since that time. When Severn P. Ker, general manager of sales, now president of the Sharon Steel Hoop Co., left the Republic company Charles T. Johnston was appointed his successor, and Mr. Claypool became assistant general manager of sales, with headquarters at Pittsburgh. W. W. Hall, manager of sales in the Pittsburgh district and in charge of the finished lines, will assume full charge of the Pittsburgh office Oct. 15.

TRADE NOTES

CHICAGO.—The Empire Iron & Steel Co., Chicago, advises its new warehouse at Morgan and Thirty-sixth streets will be ready about Dec. 1, and will be used solely as a warehouse from which to supply prompt trade.

CLEVELAND.—The American Range & Foundry Co. recently discontinued making stoves and is at present doing a jobbing foundry business.

CLEVELAND.—The Ford Motor Co., Detroit, recently leased the old Royal Tourist Car plant and will equip it for assembling and repair purposes.

DAVENPORT, IA.—Creditors of the Western Implement Co., Davenport, have secured the appointment of a receiver through bankruptcy proceedings before Judge Smith McPherson, of the federal court. Liabilities are said to be $100,000, with assets of $50,000.

NEW HAVEN, CONN.—The Bavier Mfg. Co., which recently incorporated its business, has elected the following officers: President, Nelson Bavier; secretary, Charles H. Clark; treasurer, John H. Fruin; vice president, A. M. Matherson. Household hardware, novelty specialties and electrical appliances are made.

PHILADELPHIA.—Wade & Co., iron and steel merchants, announce the removal of their offices from 1639 Washington avenue to rooms 503-5 Weightman building.

PITTSBURGH.—The Union Switch & Signal Co. recently received orders to the amount of over $500,000 and is at present operating its works at Swissvale to its full capacity.

PITTSBURGH.—The Allegheny Steel Co., manufacturer of sheets, plates and specialties at Brackenridge, Pa., has filed notice at Harrisburg of an intended increase in its debt from $438,000 to $688,000.

PITTSBURGH.—By the end of the month it is expected seven or eight of the 14 80-ton open-hearth steel furnaces in the plant of the Carnegie Steel Co. at Bessemer, Pa., will be in operation. The entire battery is expected to be in operation before the end of the year.

PITTSBURGH.—E. E. Brosius, Machesney building, has received an order for 50 hot mill trucks from Samuel Diescher & Sons, Farmers' Bank building, consulting engineers, for installation in the new tin plate mill of the Wheeling Sheet & Tin Plate Co., nearing completion at Yorkville, O.

PITTSBURGH.—The Kerr Turbine Co., Wellsville, N. Y., represented by R. M. Rush, Oliver building, this city, has received a contract for a 200-horsepower "Economy" turbine, with Falk reduction gears, to drive a three-stage Epping-Carpenter pump to be installed in the Phipps power plant of the Duquesne Light Co., Pittsburgh.

PITTSBURGH.—The Thomas Carlin & Sons Co. recently shipped the Westinghouse Electric & Mfg. Co. a 6-foot stationary pan for grinding brass ashes in its brass foundry, and a belt-driven shear to cut 66 inches to the Coatesville Scrap Iron & Steel Co., Coatesville, Pa. Orders are being filled for a 9-foot dry pan for Worth Bros., Coatesville, Pa., a No. 3 shear for the United Steel Co., Canton, O., and a No. 61 shear for the National Rolling Mill Co., Vincennes, Ind.

PITTSBURGH.—The George J. Hagan Co., Peoples Bank building, has received a contract from the National Enameling & Stamping Co., Granite City, Ill., for installing American stokers in 18 annealing furnaces, 20 pair furnaces and 20 sheet furnaces in the tin mill, and six pair furnaces and six double sheet furnaces in the sheet mill. The Hagan company also has received a contract for furnaces and stoker equipment for the new plant of the Wheeling Sheet & Tin Plate Co., Yorkville, O.

WARREN, O.—The last of the 12 hot mills at the new plant of the Trumbull Steel Co. were placed in operation last week.

WHEELING, W. VA.—The J. E. Moss Iron Works announces the removal of offices and works to Twenty-eighth and Chapline streets, where facilities are greatly enlarged to care for increased business.

NEW BUSINESS

In New York, the machinery market continued last week to reflect the improvement which was reported in the preceding issue of THE IRON TRADE REVIEW. No new business of importance came out and no new inquiries of any size were received by the trade. There was a more satisfactory volume, however, of small orders. The past two months have been attended by good export machinery business on the part of the larger houses in the east, which have taken pains lately to develop their business in this connection.

In Pittsburgh, machine tool builders and dealers continue to experience quiet market conditions, although numerous orders for single tools are being received. The consuming trade, however, appears satisfied to await developments, and many negotiations are being held up indefinitely. Manufacturers of heavy rolling mill equipment, on the other hand, continue busy, and foundries are operating at practically full capacity. Just as soon as the present period of uncertainty disappears, it is believed activity will prevail in all lines.

In Philadelphia, there has been a perceptible change for the better in the machinery market. Not many large inquiries were made, but the small tool business is showing renewed vigor with future prospects very much brightened. There has been quite an acceleration in the sales of electrical machinery and equipment for power houses during the past week. There seems to be very little demand for second-hand machinery. The majority of the local manufacturers taboo the idea of the Underwood tariff law interfering with the machinery business of the country and give no credence to the rumor that the railroads are withholding needed orders on this account.

In Cincinnati, there is a great deal of doubt among machinery manufacturers as to just what effect the new tariff bill will have upon local conditions. The machine tool makers generally state that their business will be seriously affected by the influx of foreign-made machine tools that will follow as a result of the reduction of the tariff on them. Business at the present time is rather dull, and is about evenly divided between foreign and domestic trade, orders being generally for single tools. One and possibly two large machine shops are running over 65 per cent of their capacity, while the others are all probably below this. September business, though, appears to have been slightly in excess of that done in August. The foundries are not very busy, having not as yet entirely recovered from the recent strikes. There are few orders for castings from the machine tool makers.

ALABAMA

ALABAMA CITY.—The city plans to expend about $18,000 for a sewer system.

ANNISTON.—The Lynchburg Foundry Co. plans to erect a plant for the manufacture of pipe cores.

ARKANSAS

FORT SMITH.—The Fort Smith Excelsior Co. plans to build a factory estimated to cost $12,000.

JONESBORO.—The city council recently authorized the erection of a city hall. Estimated cost, $30,000.

LITTLE ROCK.—The plant of the Flecher Coffee & Spice Co. was recently damaged by fire. Estimated loss, $50,000.

PINE BLUFF.—The Arkansas Packing Co. plans to expend about $45,000 for equipment in its new plant.

CALIFORNIA

ALTA.—The plant of the Southern Cross Mining Co. was recently damaged by fire. Estimated loss, $60,000.

LONG BEACH.—The citizens recently voted a $200,000 bond issue for water-works extensions.

REDDING.—The city recently completed plans for a steel bridge across the Sacramento river estimated to cost $45,000.

VENICE.—The Union Ice Co. plans to erect an ice plant estimated to cost $100,000.

COLORADO

DENVER.—The National Biscuit Co. plans to erect a $1,500,000 plant for the manufacture of its specialties.

CONNECTICUT

BRIDGEPORT.—The Sprague Meter Co. is having plans prepared for a one-story addition. Plans call for a structure 48 x 63 feet, brick construction.

HARTFORD.—The Builders' Finish Co. is receiving bids for the construction of a 200,000-gallon steel or wood water tank for its plant on Potter street.

HARTFORD.—The Donegan Auto Body & Specialty Co. has been incorporated; automobile parts; $21,000; by W. R. Donegan, J. J. Walsh and L. S. Risley, Hartford.

MERIDEN.—The International Casket Hardware Co. has been incorporated; $69,600; by W. A. Conkling, president; A. V. Enginton, vice president; C. J. Hinsdale, treasurer, and G. G. Merwin, secretary.

NEW BRITAIN.—The New Britain Gas Light Co. plans to erect a two-story, 25 x 60-foot and a one-story, 25 x 25-foot addition.

STAMFORD.—The Celluloid Zapon Co. plans to erect a brick and steel addition 41 x 114 feet, and a frame building 55 x 110 feet. Estimated cost $20,000.

WATERBURY.—The Birmingham Iron Foundry Co. recently purchased a tract upon which it plans to erect an addition to its roll department.

DELAWARE

WILMINGTON.—The Tolbert Construction Co. has been incorporated; $25,000; by O. J. Reichard, Wilmington.

DISTRICT OF COLUMBIA

WASHINGTON.—Sealed proposals will be received at the office of the United States Reclamation Service, Malta, Mont., until Nov. 2, for earthwork and structures, Vandalia South canal, involving about 480,000 cubic yards of excavation, 2,600 cubic yards of reinforced concrete, and the placing of 250,000 pounds of steel reinforcement. Further information concerning these requirements may be obtained upon application to the Reclamation Service, Washington.

IDAHO

BOISE.—The contract for semi-steel discharge pipe for balanced valves in Arrowrock dam of reclamation service has been awarded to Minneapolis Steel & Machinery Co. for $19,420.

EMMETT.—The Emmett Irrigation Co. is laying plans for replacing a large amount of wooden flume with steel and concrete.

IDAHO FALLS.—The county commissioners and city council have granted franchise to Idaho Falls Electric Railway Co. to operate interurban trains along 40 miles of streets and surrounding roads.

NEWSOME.—M. H. Hare, Peyton building, Spokane, Wash., is in the market for riveted steel pipe and hydraulic giants for placer mining here.

PIERCE.—The gold dredge belonging to M. H. Hare, Peyton building, Spokane, has been destroyed by fire with a loss of $74,000. It will be replaced at once.

ST. MARIES.—J. H. Spalding, manager of Michigan Lumber Co., says work on new factory building will begin at once. Site has been purchased.

TWIN FALLS.—To operate an interurban line between Twin Falls and Shoshone Falls the Twin Falls Railroad Co. has been incorporated for $1,000,000. Distance to be covered in immediate future is 12 miles. Construction work will begin at once. R. Spofford and J. C. Moore of Twin Falls, principal owners.

ILLINOIS

CHICAGO.—Lertell Bros. plan to erect a one-story, 25 x 80-foot brick foundry estimated to cost $3,000.

CHICAGO.—The H. P. Nelson Co. plans to erect a three-story, 50 x 134-foot factory estimated to cost about $23,000.

CHICAGO.—The Crane Co., manufacturer of pipe fittings and brass goods, plans to erect a new manufacturing plant here.

CHICAGO.—The Joslyn Mfg. & Supply Co. plans to erect a 113 x 200-foot factory for the manufacture of electrical specialties.

CHICAGO.—F. C. Brightly plans to erect a galvanizing plant 40 x 100 feet, estimated to cost $50,000. J. F. Rarnfeld, architect.

CHICAGO.—The plant of the Independent Packing Co. was recently damaged by fire. Estimated loss $50,000.

CHICAGO.—The Tusko Mfg. Co. has been incorporated; $15,000; by W. H. Williams, E. B. Wilkinson and R. H. Jones.

CHICAGO.—The Joslyn Mfg. & Supply Co. advises it is building a branch distributing warehouse at Kansas City on a site 113 x 490 feet, part of which will be covered this year and the remainder next year. No equipment

will be needed. Structural steel will be used and bids will be received at once. James Oliver Hogg, Kansas City, Mo., is supervising architect.

CHICAGO.—The Automatic Double Lock Car Coupler Co. has been incorporated; $25,000; by L. Le Compte, J. J. Cullen and H. Milligan.

CHICAGO.—The Vassar Swiss Underwear Co. recently completed plans for a four-story factory affording six acres of floor space. Estimated cost $750,000.

CHICAGO.—The Steelcrate Expanded Metal Co. of Illinois has been incorporated; $2,500; by H. B. Chess Jr., A. C. Wylie and J. C. Sheriff.

CHICAGO.—The Mutual Electric Mfg. Co. has been incorporated; electrical goods; $350,000; by H. A. Boissat, T. Dimmock and E. C. Parsons, Chicago.

CHICAGO.—The National Car Equipment Co. has been incorporated; railway equipment; $50,000; by H. S. Hanshy, T. Henderson and W. H. Hoover, Chicago.

ROCKFORD.—The Ford Mfg. Co. plans to erect a 40 x 140-foot addition to its plant in this city.

STREATOR.—The Western Glass Co. plans to make additions to its plant estimated to cost $20,000.

INDIANA

FORT WAYNE.—The S. F. Bowser Oil Tank & Pump Works recently began construction work on an addition estimated to cost about $20,000.

FORT WAYNE.—The Fort Wayne Electric Works advises it has not completed plans or let contracts for an addition. Plans are being worked on and an appropriation may be made later for an addition deemed necessary.

INDIANAPOLIS.—The Johnson & Waggoner Acetylene Gas Machine Co. has been incorporated; acetylene gas generators; $10,000; by W. K. Johnson, B. E. Johnson and Cleveland Waggoner.

INDIANAPOLIS.—The Electric Steel Co. has been incorporated; steel manufacturers; $100,000; by H. H. Buckman Jr., H. McK. Landon, G. A. Weidey, J. D. Forrest and C. P. Wilson.

LA PORTE.—The La Porte Mat & Mfg. Co. has applied for a charter to manufacture flexible steel mats and matting, rigid wire door mats, automobile creepers, wall ties and similar articles. Charles M. Elliott, formerly with the Keystone Wire Matting Co., Beaver Falls, Pa., for 17 years, will have charge of the manufacturing.

RUSHVILLE.—The Chas. D. Francis Co. is having plans prepared for a two-story, 50 x 100-foot factory and a one-story, 30 x 100-foot storage building. Woodworking machinery will be required.

TERRE HAUTE.—The Engine Co. of Indiana has been incorporated; engines; $10,000; by W. P. Childs, O. E. Childs and O. Mader.

IOWA

DAVIS CITY.—The citizens recently voted a $6,500 bond issue for a water-works system.

DES MOINES.—The Des Moines Ice Co. plans to erect a $30,000 addition to its plant.

GUTTENBURG.—The plant of the Guttenburg Saw Mill was recently damaged by fire. Estimated loss $25,000.

KELLOGG.—The Gould Balance Valve Co. recently leased an 85 x 150-foot site from the Chicago, Rock Island & Pacific railway for its proposed foundry and warehouse.

KEOKUK.—The plant of the Purity Oats Co. was recently damaged by fire. Estimated loss $40,000.

WATERLOO.—The Citizens Gas & Electric Co. plans to build a power plant estimated to cost about $600,000.

KANSAS

PEABODY.—The Peabody electric light and ice plant was recently damaged by fire. Estimated loss $25,000.

PRATT.—The city recently voted a $50,000 bond issue for the installation of a municipal light plant.

KENTUCKY

CARROLLTON.—The Wood Auto & Machine Co. is erecting a machine shop for which new machinery equipment will be required.

CENTRAL CITY.—The Standard Oil Co. plans to erect a storage plant. Boiler, engine, pumps and other equipment will be required.

DIXON.—Melton Bros., flour millers, are considering installing an electric light plant. They are planning to purchase used machinery.

JENKINS.—The Consolidation Coal Co. plans to increase the capacity of its power plant and to extend service to all of the mining communities of eastern Kentucky.

LEXINGTON.—The city recently voted a $300,000 bond issue for a new city hall.

LEXINGTON.—The Fayette Motor Car Co. will erect a new building and will be in the market for machine tools for its repair shop. W. P. Price, vice president.

LEXINGTON.—James B. Haggin is considering the erection of a $500,000 building at Main and Limestone streets to be used for hotel and office purposes.

LOUISVILLE.—The cement plant of the R. B. Tyler Co. was recently damaged by fire. Estimated loss $25,000.

LOUISVILLE.—The National Power Co. plans to erect a $500,000 plant here for the manufacture of hydro-electric generators.

LOUISVILLE.—The plant of the Louisville Tin & Stove Co., Thirteenth and Maple streets, was damaged by fire. The loss was $120,000. It will be rebuilt, officers of the company say.

LOUISVILLE.—The Imperial Wire & Iron Works, which has been considering building a new factory, has taken out a permit for its erection, and will be ready to consider the purchase of new machinery shortly.

LOUISVILLE.—The Big Creek Coal Co. recently incorporated, advises it is to open its property at Bremen, Muhlenberg county, Ky., in a short time and will erect an up-to-date mining plant about 1,000 tons a day, operating by electricity. No equipment has been bought.

OWENSBORO.—An electric elevator will be purchased by the Jesse-Forgy Garage Co., which is also considering the enlargement of its repair shop.

PADUCAH.—The American Metal Tie Co. has been incorporated to manufacture a railroad specialty; $500,000; by C. E. Stavely and L. B. Langston.

LOUISIANA

MANSFIELD.—The city recently voted a bond issue of $70,000 for water and sewer systems. J. W. Parsons, mayor.

NEW ORLEANS.—The plant of the H. W. Johns-Manville Co. was recently damaged by fire. Estimated loss $40,000.

MAINE

BETHEL.—The Carter Mfg. Co. has been incorporated to manufacture gas heaters; $100,000; by H. W. Carter, president; E. C. Bowler, treasurer.

VAN BUREN.—The International Paper Co. plans to erect a pulp and paper mill estimated to cost $2,500,000. Edward H. Blake is interested.

MARYLAND

BALTIMORE.—Strouse & Bro. plan to erect a six-story steel and concrete factory building.

BALTIMORE.—The Hannis Distillery Co. plans to erect an addition one and two stories, 42 x 56 feet. W. Wathen, architect.

BALTIMORE.—The Canton Co. plans to erect a six-story reinforced concrete warehouse estimated to cost $200,000.

MASSACHUSETTS

BOSTON.—The S. & A. Mfg. Co., Boston, advises it has been formed to manufacture a patent, self-adjusting wrench, which will be on the market about the middle of November. Officers are: President, Frank L. Sutcliffe; treasurer, Ashley D. Adams; general manager, Ambrose E. Roberts.

CAMBRIDGE.—The Riverside Boiler Works Co. is building a four-story brick and steel factory addition.

HOLYOKE.—Walsh's Holyoke Steam Boiler Works plans to erect a 20 x 42-foot, one-story addition of brick construction.

MEDFORD.—The Oliver Whyte Co., wire workers, has asked the city council of Medford for permission to build a two-story wooden factory, 65 x 168 feet, on the site of one burned several years ago.

MERRIMAC.—The Acme Tension Spring Co. recently purchased land here, upon which it plans to erect a factory.

NAUGATUCK.—The Rubber Generating Co. plans to erect a three-story, 55 x 130-foot addition.

NORTHAMPTON.—The Casner Ranger Construction Co. was recently awarded the contract for the $140,000 addition at Smith College.

SOMERVILLE.—Joseph O. Hobbs plans to erect a three-story brick and reinforced concrete building estimated to cost about $125,000.

SPRINGFIELD.—The Boston & Albany Railroad Co. plans to erect a two-story, 52 x 86-foot brick and concrete freight house here, estimated to cost $35,000.

WORCESTER.—The Broken Hill Proprietary Co., Ltd., through its consulting engineer, James B. Ladd, of Philadelphia, has ordered the gas producers for its new steel plant in Australia from the Morgan Construction Co., Worcester, Mass. This order is for 15 10-foot Morgan continuous gas producers with George mechanical feeders.

MICHIGAN

BAY CITY.—The Defoe Boat & Motor Works advises its new building is for the manufacture of power boats and woodworking machinery will be used.

BAY CITY.—The Bay City Dredge Co. is erecting a foundry and machine shop. The company is capitalized at $40,000. Officers are as follows: Geo. D. Jackson, president; Wm. Burnett, vice president; W. W. Billington, treasurer and Shelley C. Crump, secretary.

DETROIT.—The Detroit Turbine Mfg. Co. has been incorporated with a capital of $50,000.

DETROIT.—The Morgan & Wright Tire Co. plans to erect an addition to afford 40,000 square feet of floor space.

DETROIT.—The Wayne County Creamery Co. plans to erect a five-story, 70 x 200-foot addition estimated to cost $75,000.

DETROIT.—The Metal Parts Engineering Co., of Detroit, has been incorporated to manufacture auto parts; $25,000; by W. L. Kenfield and W. W. McIntyre.

DETROIT.—The Michigan Steel Boat Co. plans to erect a four-story building adjoining its present plant. Plans call for a 56 x 400-foot structure estimated to cost about $25,000.

GRAND RAPIDS.—The Grand Rapids Show Case Co. recently completed plans for additions estimated to cost $6,000.

JACKSON.—The Michigan Central railroad will erect a boiler and tank shop and new roundhouse, each to cost $90,000, at their junction shops here.

LANSING.—The proposed Detroit-Grand Rapids electric line has been financed. The road will cost $6,000,000, and will require three years to build. Surveyors are now at work between Lansing and Grand Rapids.

MONROE.—The Van Blerck Motor Co., Detroit, has purchased a factory site in this city. Plans call for a plant 50 x 170 feet.

PONTIAC.—A $25,000 bond issue was recently voted for the purchase of pumping machinery.

PONTIAC.—The Hubbard Spring Works is erecting an addition which will practically double its capacity. No equipment will be required at present.

WAYNE.—This village has taken steps towards the installation of an independent water system to cost approximately $27,000. Smith & Boulay of Toledo, engineers, are planning the system.

MINNESOTA

CARLTON.—The citizens recently voted a $25,000 bond issue for a water-works system.

DULUTH.—The Kelroy Heating Co., recently incorporated with a capital of $250,000, is having plans prepared for a plant for the manufacture of heating plants. (Incorporation noted Oct. 2.)

ST. CLOUD.—The Northwestern Telephone Co. recently completed plans for the erection of a two-story brick and granite building estimated to cost $35,000.

MISSOURI

CHARLESTON.—The city recently voted $40,000 for water-works improvements, including pumping station, tower and tank. C. H. Sexton, engineer.

KANSAS CITY.—The Automatic Train Control Co. has been incorporated; device for control of trains and prevention of accidents; $2,000,000; by Carl Woods, E. E. Hairgrove and C. D. Dall.

NEOSHO.—The city recently voted a $65,-

ROUND WIRE

Iron—Steel—All Finishes For Ropes—Screen Cloth—Brooms—Spring Mattresses—Clips—Staples—Stone Wire—Bundling Wire.

The Seneca Wire & Mfg. Co.
FOSTORIA, OHIO.

000 bond issue for equipment of water-works plant.

ST. LOUIS.—The Rogers-Schmitt Wire & Iron Co. recently completed plans for a two-story factory costing $20,000.

ST. LOUIS.—The Mississippi Glass Co. recently completed plans for an addition to its fire brick plant. Estimated cost, $50,000.

ST. LOUIS.—M. G. Clymer and R. C. Best plan to erect a plant for the manufacture of sorghum. Estimated cost $150,000.

ST. LOUIS.—The Halsey Automobile Co. advises it is to use the building it is erecting at St. Louis for salesrooms, garage and machine shop. Equipment has been contracted.

ST. LOUIS.—The Commercial Foundry Co., St. Louis, advises it is incorporated for $25,000 and has a temporary office at 6505 Michigan avenue, W. P. Botts, president. Full equipment is to be bought, including a 63-inch cupola with capacity of 9 tons per hour, blowers, snap flasks, overhead trolley system, molding machines and the like. A hand-power crane of 18-foot span will be bought.

MONTANA

ANACONDA.—The Northern Pacific railway has been granted a franchise for a power transmission line through Granite county.

HARDIN.—B. C. Lillis is engineer in charge of plans for a large dam and hydro-electric plant to be built on Big Horn river near here.

MALTA.—The council has awarded the contract for waterworks and sewer to George W. Kemper, Minot, S. D., at $32,000.

MELVILLE.—The Melville Milling Co. has been incorporated for $10,000. Thomas G. Blakeman, principal stockholder.

NEVADA

HAMILTON.—The Hamilton Power, Mining & Transportation Co. plans to erect a hydro-electric plant estimated to cost about $35,000.

NEW HAMPSHIRE

FRANKLIN.—The Franklin mills will add an additional story to the present plant.

NEW JERSEY

ATLANTIC CITY.—The Newlin Hains Co. plans to erect an 11-story hotel estimated to cost $1,500,000.

CAMDEN.—The Eveland Engineering & Mfg. Co. has been incorporated; metal; $100,000; by S. S. Eveland, E. A. Reeve, G. H. B. Martin. Camden.

EAST ORANGE.—The Public Service Railway Co. plans to erect a two-story brick repair shop and office building on Main street. Estimated cost $74,000. R. E. Danforth, general manager.

NEWARK.—The Barlow Foundry Co. plans to expend $30,000 in erecting a foundry here. Arthur B. Miler, architect.

NEWARK.—The Aluminum Goods Mfg. Co. plans to erect a six-story, 60 x 200-foot brick plant for which a site of 46 lots was recently purchased. New equipment will be required.

TRENTON.—The American Steel & Wire Co. plans additions and alterations to cost $100,000.

TRENTON.—A. Mecky & Co., manufacturers of buggies, plan to erect a one-story, 80 x 750-foot brick factory on Whitehead road.

TRENTON.—The Lewis Roth Co., Philadelphia, has been awarded a contract for furnishing a deep well pump for the artesian wells at the New Jersey state prison. The pump will cost $1,000.

TRENTON.—The Cook Linoleum Co. plans to erect a one-story brick addition. The company recently acquired the property of the former Reeves Machine Co. in the Wilbur district, to provide for extensions in its business.

TRENTON.—The Ingersoll-Trenton Watch Co. will increase its working force to 300 more in order to turn out 25,000 watches a month. The plant was recently remodeled, machinery is being added and machinists, die and tool makers are being employed. The company has offices in many foreign countries.

Woodmansee & Davidson, Inc.
ENGINEERS
All Kinds of Power Plants
SPECIALISTS in the Industrial Application of PRODUCER GAS
MILWAUKEE Wells Bldg. **CHICAGO** 1st National Bank

NEW YORK

BROOKLYN.—The Boorum & Pease Co., manufacturer of blank books, plans to erect a six-story concrete factory 100 x 105 feet. Estimated cost $100,000.

BROOKLYN.—The American Machine & Foundry Co. recently purchased a tract with 100 foot frontage for a power house and boiler shop. The company is at present constructing a three-story factory adjoining this site.

BUFFALO.—The American Agricultural Chemical Co. plans to erect a $30,000 addition to its plant.

BUFFALO.—The Hewitt Rubber Co. plans to erect a three-story, 90 x 460-foot factory and warehouse. Turner Construction Co., contractor.

BUFFALO.—The J. W. Clement Co. is having plans prepared for a 60 x 135-foot, one and three-story printing plant. Estimated cost $100,000.

BUFFALO.—The Keyboard Compositor Corporation has been incorporated; type-setting appliances; $200,000; by A. Mason McFarland, K. G. Mowat, R. A. Kellogg, F. F. Baker, C. A. Reif and H. Ulrici, Buffalo.

GENEVA.—The United States Lens Co. plans to erect a two-story reinforced concrete and brick factory estimated to cost $60,000.

GLENS FALLS.—The Imperial Wall Paper Co. recently completed plans for a three-story plant to replace the building recently damaged by fire. Estimated cost $30,000.

GLOVERSVILLE.—Cady & Dartch plan to erect a 67 x 156-foot, three-story store and office building estimated to cost $50,000. Linn Kinne, Utica, N. Y., architect.

LONG ISLAND CITY.—The New York Consolidated Card Co. has awarded a contract to the Turner Construction Co. of New York, for a manufacturing building, 70 x 457 feet, to be erected at Fourth and Webster avenues, Long Island City.

MANHATTAN.—The United Ventilating Co., Inc., has been incorporated to manufacture and deal in ventilating apparatus, etc.; $20,000; by J. F. Krohn, 834 Hudson street, Hoboken, N. J., W. F. Kinney, 61 Fifth avenue, and R. Lambert, 152 West Forty-ninth street, New York City.

NEW YORK CITY.—The Hamery Tool & Machine Co. has increased its capital from $50,000 to $2,000,000.

NEW YORK CITY.—The American Bank Note Co. plans to erect a 35-story building estimated to cost $3,500,000. Howell & Stokes, architects.

NEW YORK CITY.—The Harroun Carburetor Co., Inc., has been incorporated; engines, etc.; $25,000; by V. Kliesrath, W. F. Blaisdell, R. B. Hults, New York City.

PLEASANTVILLE.—The village council plans to construct a 500,000-gallon reservoir.

PORT EWEN.—F. K. Brewster, Inc., has been incorporated; electric blasting caps, etc.; $500,000; by F. K. Brewster, R. S. Nichols, Paul Butler, J. J. Heney and O. S. Phillips.

RICHMOND.—The Ingram Mfg. Specialty Co. has been incorporated to deal in tin, iron and steel specialties; $25,000; by A. J. Grimes, J. T. Oates and I. A. Ingram.

ROME.—The New York Central railroad recently awarded the contract for the erection of a station here estimated to cost $90,000.

WAPPINGER FALLS.—H. L. Sterling, Newburgh, N. Y., is preparing plans for a water and sewer system here.

OHIO

ADA.—The Storer Bros. Co., recently incorporated with a capital of $25,000, is having plans prepared for an ice and cold storage plant. Z. B. Campbell, president.

AKRON.—The county commissioners are advertising for bids for the Alexander bridge in Bathe township and the Spangler bridge in Franklin township.

AKRON.—The O. C. Barber Mining & Fertilizer Co., recently incorporated with a capital of $100,000, has taken over the fertilizer plant located four miles from Canton, and plans to improve it and double the capacity.

AKRON.—The commissioners were recently granted permission by the courts to award without advertising the contracts for three bridges damaged by the floods last spring. Amount of contracts $7,500.

ASHTABULA.—The American Fork & Hoe Co. plans to erect a two-story, 42 x 62-foot structure.

ATHENS.—I. M. Foster, secretary of trustees of Ohio University, will open bids Nov. 5 for a plant for the university for lighting, power and experimental purposes. Plans by A. A. Atkinson and Geo. McLaughlin, Athens.

BATAVIA.—The Batavia Foundry Co. plans to erect an addition 36 x 40 feet.

BREMEN.—The plant of the Klanke Furniture Co. was recently damaged by fire. Estimated loss, $55,000.

CANTON.—The city plans to construct a sewage disposal plant estimated to cost $300,000.

CINCINNATI.—The American Pump & Tank Co. has been incorporated; $25,000; by S. P. Kemper, W. H. Sahr, A. C. Davis, H. H. Kemper and W. A. Knight.

CLEVELAND.—The H. Black Co., manufacturer of woolens, plans to erect a two-story addition.

CLEVELAND.—The American Range & Foundry Co. plans to erect a 48 x 95-foot addition to its plant.

CLEVELAND.—The Pilsener Brewing Co. was recently granted a permit for a $40,000 addition to its bottling works.

CLEVELAND.—The city recently awarded the contract for the erection of a municipal machine shop on Croton avenue. Plans call for a one-story, 65 x 150-foot structure.

CLEVELAND.—The Cleveland Cooperage Co. recently awarded the contract for the erection of a two-story building. Plans call for a 79 x 138-foot structure estimated to cost about $15,000.

COLUMBUS.—The Columbus Show Case Co. plans to erect a two-story addition.

COLUMBUS.—John Scott, clerk board of commissioners of Franklin county, will open bids Oct. 31 for a reinforced concrete culvert over Bliss ditch on East Main street. Plans with surveyor of Franklin county. Bids to be accompanied by certified check $200.

LIMA.—T. R. Sliemers was recently awarded the contract for the 64 x 120-foot, six-story Thomas building. Estimated cost $175,000.

LIMA.—The Ohio Electric Railway Co. plans to construct a 40 x 60-foot brick and fire-proof auxiliary power plant, to be completed by Dec. 15. Generators and other equipment will be required.

NEWARK.—C. L. Riley, county auditor, will open bids Oct. 22 for the Montgomery bridge in Madison township, superstructure steel 50-foot span, 14-foot roadway. Also Montgomery bridge in Perry township, superstructure steel 50-foot span, 14-foot roadway. Plans with county engineer.

RAVENNA.—The Ravenna Motor Truck Co. plans to enlarge its factory building by an addition 50 x 90 feet, and a concrete building, 50 x 100 feet, to be used as an assembling room.

TOLEDO.—The Urschel-Page Co. recently purchased a site for a 100 x 233-foot factory to manufacture paper bags.

TOLEDO.—The Machinery Mfg. Co. has been incorporated; $25,000; by A. M. Amberg, N. O. Winter, O. S. Brunback and J. E. Ormond.

OKLAHOMA

CHICKASHA.—The Chickasha Heat & Power Co. plans to erect an addition to its light plant estimated to cost about $10,000. The Lisle-Deming Construction Co., contractor.

OKLAHOMA CITY.—The N. S. Sherman Machine & Iron Works has been incorporated; $100,000; by N. S. Sherman Sr., N. S. Sherman Jr., W. S. Sherman, N. V. Hope and N. M. Sherman, Oklahoma City.

TULSA.—The Tulsa Engineering & Supply Co. has been incorporated; $3,000; by J. E. Devine, M. F. Chadwick, J. T. Nixon, et al, Tulsa.

OREGON

GRANTS PASS.—The contract for building the municipal part of the Grants Pass-Crescent City railroad has been awarded to J. F. Reddy of San Francisco.

PENDLETON.—The water commission has awarded the contract for laying 8,000 feet of pipe through Thorn Hollows bluffs to Jefrey & Bufton for $23,000.

PORTLAND.—The Portland Cordage Co. plans to add a story to its plant. Emil Schacht & Sons, architects.

PORTLAND.—The Electric Steel Foundry Co. is erecting a 60 x 80-foot foundry at Twenty-fourth and York streets. This company succeeded the Portland Bronze & Crucible Steel Foundry, with works on York street between Twenty-second and Twenty-third.

Grey Iron Castings
We need contracts to make 20 tons more per day, to reduce the cost of production. Our capacity is 50 tons a day; size from 100 pounds down. Willing to work on a very close margin—get our prices.
THE DUNHAM COMPANY
Mfs. of Agricultural Implements
Berea, Ohio

Steel castings will be the output. A new electric melting furnace will be a part of the equipment. Leonard Schad is president.

PORTLAND. — The Columbia Steel Co., Tenth and Johnson streets, is manufacturing solid manganese steel crossings for the United Railroads of San Francisco, and recently filled similar orders for the Southern Pacific railroad and the Northern Electric Co., both orders to be used in California.

THE DALLES.—Fire destroyed the Standard garage doing $50,000 worth of damage to repair machinery, stored automobiles and building.

PENNSYLVANIA

AMBRIDGE.—The Standard Tube Co. plans to erect a $5,000,000 plant for the manufacture of seamless tubing.

BEAVER FALLS.—The Union Drawn Steel Co. plans to erect a 50 x 125-foot brick and steel addition to contain the furnace and pickling rooms.

CARLISLE.—The Interwoven Stocking Co. of Martinsburg, W. Va., plans to erect a 140 x 200-foot plant here, estimated to cost about $300,000.

CONNELLSVILLE. — The Crescent Coal & Coke Co. has filed articles of incorporation with the state department at Dover, Del., with a capital stock of $8,000.

ERIE.—The Crawford-Cummings Co. has been incorporated with a capital of $25,000, to manufacture and sell engines and other machinery. Incorporators: John M. Crawford, Parkersburg, W. Va.; Joseph Crawford, Erie, Pa., and Edgar C. Cummings, Erie.

FOLSOM.—William Sellers & Co., Philadelphia, plan to erect a one and two-story brick, steel and concrete factory building.

HAZLETON.—Liebowitz & Son plan to erect a brick and steel factory estimated to cost $60,000.

PHILADELPHIA.—Cramp & Co. are preparing plans for a municipal machine shop estimated to cost $99,685.

PHILADELPHIA.—The North Penn Ice Mfg. Co. plans to erect a one-story ice storage and manufacturing plant to be 70 x 100 feet, with a wing 26 x 119 feet, estimated to cost $22,000.

PHILADELPHIA.—John T. Windrim has plans and specifications prepared and is taking bids on a storage building for the Philadelphia Electric Co., to be erected at Twenty-fourth and Christian streets.

READING.—The Penn Shear Co. plans to erect a two-story, 50 x 150-foot addition estimated to cost $20,000. The first floor will be devoted to factory purposes and the office department, while the second will be used for packing.

VERSAILLES.—The Central Railways Signal Co. plans to erect an addition to its plant for the manufacture of railroad fuses.

WILKESBARRE.—The Keystone Clay Co. has been chartered with a capital of $5,000 to manufacture clay and shale products. Arthur E. Royer and Harris B. Hamlin, both of Wilkes-Barre, are named as incorporators.

RHODE ISLAND

WOONSOCKET.—The Taft Pierce Mfg. Co. has been incorporated to manufacture machinery and tools; $300,000; by L. V. Hubbard, E. E. Jackson Jr., F. S. Blackall, G. Gordon and R. W. Reed.

TENNESSEE

KNOXVILLE.—The Thornton Lead & Steel Corporation has been incorporated to develop lead property of 251 acres on Tennessee river; $124,000.

MEMPHIS.—Anthony S. Hill is to build a saw mill of large capacity and will be in the market for two boilers and a double band mill.

TEXAS

BEAUMONT.—The plant of the Magnolia Petroleum Co. was recently damaged by fire. Estimated loss $50,000.

DALLAS.—The Southwestern Iron & Metal Co. has been incorporated; $6,000; by H. Rosen, P. Lipsitz and E. Karchmer, all of Dallas.

FREEPORT.—The tax payers of Brazoria county recently voted a $60,000 bond issue for a steel bridge across the Brazos river, connecting Freeport and Velasco.

HOUSTON.—The Galveston-Houston Electric Co. recently increased its common stock from $4,000,000 to $5,000,000 and its preferred stock from $3,000,000 to $4,000,000.

WAXAHACHIE.—The city recently voted a $22,500 bond issue for additions to the municipal water-works plant.

WASHINGTON

BREMERTON.—Contract for bag factory at Puget Sound navy yard has been awarded to Ben Sandel at $18,857. Construction work to begin at once.

BREMERTON.—The government has awarded the contract for furnishing compressors, filters, etc., for Puget Sound navy yard to Laidlaw-Dunn-Gordon Co., 115 Broadway, New York, for $39,800.

CHETLO HARBOR.—The new lumber mill of Hobbs & Shaw, which was recently completed, has been destroyed by fire.

OLYMPIA.—The Coast Bridge Co., Portland, was recently awarded the contract for a bridge over the Chehalis river. Contract price $15,600.

OLYMPIA.—With a loss of $35,000, fire destroyed the plant of the Black Lake Mill Co., at Black Lake, 5 miles from here. Officials say it will be rebuilt.

OLYMPIA.—The Crescent Oil Co., C. R. Barney, secretary, has applied to the city council for a franchise to distribute natural gas through city from well to be bored at Tenino.

PEARL HARBOR, H. I.—Lord Young Engineering Co., Honolulu, was low bidder for war department with an offer of $109,400. Spalding Construction Co., Portland, Ore., was next with bid of $109,800.

RAYMOND.—The city council has awarded a franchise to build and operate a gas plant here to H. W. Urquhart, of Chehalis, and John Stewart, of Seattle. Plant to be built at once.

SEATTLE.—An ordinance which means the extension of Denny hill regrade has been passed by the council. Engineer's estimate for work is $400,000.

SEATTLE.—The Port of Seattle commission opened the following bids for gates for Lake Washington canal: Penn Bridge Co., Beaver Falls, Pa., $309,691; United States Steel Products Co., $317,812; Chicago Bridge & Iron Works, $385,541.

SEATTLE.—Board of Public Works announces that remaining contracts for municipal car line on bids already received will be awarded at once. New plans for car barns and shops have been finished and bids will be taken at once. Board says line will be finished by Dec. 1.

SPOKANE.—The United Lead Mining Co. has contracted for a 100-ton mill to be installed in its mine at Osborn, Mont.

SUMAS.—Sumas Water Co. is contemplating an extension of its service.

WEST VIRGINIA

EUREKA SPRINGS.—The city plans to expend about $100,000 on municipal water-works.

KEYSTONE.—The Pocahontas Foundry & Machine works has been incorporated; foundry, machine works, electrical apparatus, etc.; $25,000; by K. M. Bright, J. B. Purcell, T. F. Henritz, L. Brinkley and J. G. Sale, Welch, W. Va.

SPRINGFIELD.—The Magnolia Power Co. plans to construct a hydro-electric plant to develop 13,000 horsepower. Estimated cost, $1,000,000.

WHEELING.—The Wheeling Steel Casting Co. plans to erect an addition. C. H. Dowler, president.

WISCONSIN

ANTIGO.—The Springbrook Farm Co. has been incorporated to manufacture and deal in farm machines; $20,000; by Henry Hay, C. J. Te Selle and J. H. Halechka, Antigo.

LADYSMITH.—The Ladysmith Implement Co. has been incorporated to manufacture and deal in all kinds of farm implements; $5,000; by A. F. Hein, J. Hein Jr., and Frank Hein, all of Ladysmith.

MILWAUKEE.—The Falk Co., manufacturing railroad special work, kerosene engines, etc., has increased its capital from $1,000,000 to $1,250,000. The additional issue is 6 per cent preferred, and was immediately taken by the present stockholders. Herman W. Falk, president.

MILWAUKEE. — The Milwaukee Western Cold Storage Co. plans to erect an annex to its plant estimated to cost $650,000.

MILWAUKEE.—The Carpenter Baking Co. recently completed plans for a three-story, 65 x 170-foot building estimated to cost $100,000.

MILWAUKEE.—The Koehring Machine Co., manufacturing concrete mixing machinery and small steam engines will erect an office building costing $15,000 at the works.

MILWAUKEE.—The Loop Nut Co. has been incorporated to manufacture loop nuts and

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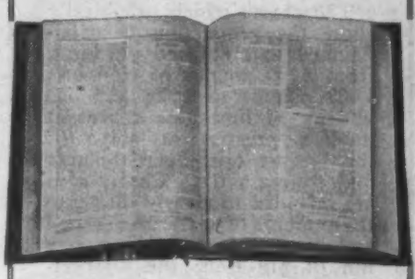

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CLEVELAND - OHIO

The

Rolling Mill Industry

By F. H. KINDL, Engineer

A Condensed, General Description of Iron and Steel Rolling Mills and Their Products.

Cloth, Illustrated . . . $2.00
Full Flexible Leather, $3.00

In this work the author has endeavored to give a condensed, general description of iron and steel rolling mills and their products, without discussing the details of rolling any special material. Essentially, it is a summary of American rolling mill practice, its development being traced from the beginning to the present day.

An effort has been made to define more closely the various mills and their products and the various classifications herein presented have been approved by leading manufacturers and many of the country's foremost iron and steel engineers.

The charts which graphically show the production of semi-finished and finished products, from 2,000 pounds of iron ore, 1,000 pounds of coke and 600 pounds of limestone represent modern practice at some of the largest open-hearth plants and rolling mills. Charts also are included to clearly illustrate the amounts of material charged and produced in making one ton of pig iron; the distribution and production of iron and steel in 1907 and 1911; the conversion of pig iron into the various finished products, etc.

For those interested in the economics of the iron industry, a table has been prepared in which a comparison has been made of the general fundamental factors dictating the production of pig iron in the United States, Germany and Great Britain, with particular reference to the Pittsburgh district of the United States, the Rheinland-Westfalia district of Germany, and the Cleveland district of Great Britain.

The Iron Trade Review
Publisher
Penton Bldg. **Cleveland, Ohio**

machinery; $25,000; by L. S. Pease, G. H. Owen and R. Denniston, Milwaukee.

MILWAUKEE.—The Steam Appliance Co. is preparing to occupy its new plant at Sixty-third avenue and North Burnham street, in West Allis, Milwaukee county. The main building is of brick and steel, 166 x 80 feet.

MILWAUKEE.—The A. B. Monsted Co., Milwaukee, was awarded a contract to construct a concrete and steel standpipe for the municipal waterworks system at Fulton, N. Y., at $24,355.

MILWAUKEE.—The W. M. Durant Co., 523 Market street, manufacturing counting machines, has decided to build a new factory group, costing $15,000. Work will be started at once.

MILWAUKEE.—The Robinson Auto Heater Co. has been incorporated to manufacture heating devices for heating automobiles; $25,000; by J. K. Robinson, E. W. Robinson and H. L. Kellogg, Milwaukee.

MILWAUKEE.—The contract for furnishing and installing eight electric elevators in the new 16-story First National Bank building, Milwaukee, was awarded to the Otis Elevator Co., Chicago, at $114,000. D. H. Burnham & Co., architects, Chicago.

MILWAUKEE.—The Ticonic Investment Co., owner of considerable property in the downtown district of Milwaukee, which it is rapidly improving, has had plans prepared for a light manufacturing building at the northeast corner of Jackson and Huron streets, costing $200,000. The building will be six stories, 100 x 120 feet, of reinforced concrete and brick. It will be designed for light manufacturing, particularly the metal trades. H. A. J. Upham, 921 Wells building, is manager.

NEW RICHMOND.—The saw mill of the Willow River Lumber Co. was recently damaged by fire. Estimated loss $100,000.

RACINE.—Fire resulting from a defective furnace caused damage amounting to $4,000 to the plant of the Harvey Spring Co., which only recently completed extensive additions. Only temporary inconvenience is resulting.

WAUZEKA.—The Wauzeka Electric Light & Power Co. advises it is organized with capital of $30,000 to furnish light and power. It is purposed to install a 25-K. W. D. C. generator with 120 A. H. storage battery, switchboard, etc. No equipment has been bought. Power will be furnished from Wauzeka Roller Mills plant.

WEST BEND.—The West Bend Barn Equipment Co. is having plans prepared for a three-story concrete factory building.

DOMINION OF CANADA

ALBERTA

CALGARY.—The Canadian Northern railway will build a $500,000 depot in Calgary, and will join with the city in the erection of a big livestock market.

CALGARY.—The most up-to-date warehouse in western Canada has just been completed in Calgary in the warehouse and office building of the Cockshutt Plow Co., Ltd. The building is equipped with two large electric freight elevators of 3,000 and 5,000 pounds capacity, while two spur tracks will allow the handling of six carloads of implements at once.

EDMONTON.—A combined fire hall and police station will be built at a cost of $350,000 for Edmonton.

EDMONTON.—Edwin Auld plans to erect a seven-story steel building estimated to cost about $110,000. Canchon & Van Tyne, architects.

MEDICINE HAT.—Plans are being prepared for an addition to the power plant and the installation of machinery estimated to cost $250,000.

BRITISH COLUMBIA

PITT LAKE.—The British Columbia Transportation Co. will expend $100,000 on improvements and additions to its rock-crushing plant.

VANCOUVER.—Tenders will shortly be called by the Public Works department, R. C. Desrochers, of Ottawa, secretary, for an immigration building at $300,000. It will be a five-story, reinforced steel beam construction building, 220 x 64.

VANCOUVER.—J. G. White, the well-known English contractor, has secured the $30,000,000 contract for harbor extension for Vancouver. Some 25 miles of dockage, as well as a further amount for industrial sites and railway terminals will be built, and will probably be later turned over to the government by the Vancouver Harbor & Dock Extension Co., which was given foreshore rights.

VICTORIA.—The Hudson Bay Co. plans to erect a store building estimated to cost $600,000. H. E. Burbridge, chief engineer.

VICTORIA.—The British Columbia Pottery Co. plans to rebuild its plant recently damaged by fire. Estimated cost, $125,000.

MANITOBA

WINNIPEG.—Tenders will be received till Oct. 16 for the manufacture and delivery in the Grand Trunk Pacific shops at Transcona, of transformers and switching apparatus. M. Peterson, secretary of the board of control, may be applied to.

WINNIPEG.—The United States Steel Products Co., of New Jersey, has applied to the provisional government for permission to operate in Manitoba. This corporation is the selling organization in foreign lands for the United States Steel Corporation.

NEW BRUNSWICK

CAMPBELLTON.—The plant of the McLennan Foundry & Machine Co. was recently damaged by fire. Estimated loss, $30,000.

ONTARIO

BRANTFORD.—A factory core room will be built by the Massey Harris Co., Ltd., at a cost of $8,000. A. J. Cromar of 448 Colborne street, is general contractor for the building, which will be a three-story brick, concrete and steel building, 42 x 92.

HAILEYBURG.—The Kerr Lake branch of the Temiskaming & Northern Ontario railway will probably be electrified by the T. & N. O. commission. Chairman J. L. Englehart, of Toronto street, Toronto, may be applied to.

HAMILTON.—An addition to its foundry at a cost of $5,000 is being built by the Sawyer-Massey Co. George E. Mills of 614 King street E., is general contractor.

HAMILTON.—Work will be started at an early date on a $150,000 factory, which the Canadian Westinghouse Co. proposes to build in Hamilton. It will be of reinforced concrete.

HAMILTON.—The Dominion Steel Foundry Co. advises the addition it is putting up is to be used in connection with the finishing and shipping department. All equipment has been bought and the structure will be completed in a short time.

QUEBEC

MONTREAL.—The Canadian Stove & Furniture Co. is having built a stove foundry at $60,000. The James Shearer Co., of 225 St. Patrick street, is general contractor.

MONTREAL.—Tenders will shortly be called by the harbor commissioners for the steel for the $200,000 freight sheds to be built. The building will be of two stories, 112 x 485 feet.

MONTREAL.—An inspection of the new steel plant being built for the Armstrong-Whitworth Co. in Montreal indicates that by December it will probably be ready for the machinery. The plant consists of five buildings, all of good size.

MONTREAL.—Cadillac Motors, Ltd., has been incorporated to carry on a general automobile and motor vehicle manufacturing business; $50,000; Francis G. Bush and Herbert W. Jackson, bookkeepers; George Brennan, stenographer, and others of Montreal.

ST. MALO.—The Canada Iron Corporation is sub-contractor for a quantity of the supplies for the $1,500,000 car repair shop for the Transcontinental railway for which Joseph Gosselin, of Levis, is general contractor.

SASKATCHEWAN

MOOSE JAW.—The new interior storage elevator to be erected by the dominion government at Moose Jaw will consist of 84 concrete tanks with 66 interspace tanks. The buildings will be concrete, brick and steel, and of fireproof construction. There will be receiving, cleaning and shipping plants with workhouse, track sheds, storage house and drier plant.

REGINA.—The addition of another filter bed to the sewage disposal works is contemplated by the city council. F. McArthur is city engineer.